

BRITISH MEDICINE and the VIENNA SCHOOL



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At the same time, the author discloses new facts of great interest, and he shows how English and Austrian scientific ideas throughout the last two centuries have influenced and interacted one upon another.

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BRITISH MEDICINE
AND THE
VIENNA SCHOOL
Contacts and Parallels

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Contacts and Parallels

by

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LONDON

WILLIAM HEINEMANN MEDICAL BOOKS LIMITED

1943

FIRST PUBLISHED IN 1943



THIS BOOK IS PRODUCED IN COMPLETE
CONFORMITY WITH THE AUTHORIZED
ECONOMY STANDARDS

Printed in Great Britain by
UNWIN BROTHERS LIMITED, LONDON AND WOKING

TO THE MEMORY
OF THE LATE
SIR D'ARCY POWER, K B E

PREFACE

THE reputation of Vienna as a focus of medical science goes back to the middle of the eighteenth century. A small clinic containing only twelve beds, the first established on German soil, became the cradle of the world-wide renown of Austria's medicine. That clinic was animated by the spirit of Boerhaave's school. The old Vienna School was indeed a daughter school of the Medical School at Leyden, and flourished during six decades. Afterwards its splendour began to fade, internal medicine particularly had no important representatives though brilliant experts in ophthalmology and obstetrics were not lacking.

After that period of stagnation the so-called New or Second Vienna School grew up to be discovered and acknowledged by foreign medical visitors. And the time came again "when something was to be learned in Vienna and things to be seen there that elsewhere would be sought in vain." The essential character of this new school was the reconstruction of all medical knowledge on exact foundations of pathological anatomy and physical diagnostic, starting from the achievements of the Parisian School. In the middle decades of the nineteenth century there was a widespread feeling that no European doctor's education was complete unless he had spent a considerable period of study in Vienna. At the close of the sixties the sceptre gradually passed from Vienna to the Berlin School. But the high development of specialism at Vienna, particularly in Dermatology, Ophthalmology, Laryngology and Otology made the old seat of learning the chief place of pilgrimage for foreign physicians. The appointment of Billroth and Nothnagel was the cause of a closer connection between the School of Vienna and the schools of Germany. In the course of the nineties of the last century

Austrian Medicine succeeded in catching up that of Germany and thenceforth has contrived to keep pace with it

The history of the medical faculty of Vienna has been worked upon intensively, and its connection with Padua, Leyden, the Parisian and the German schools has been dealt with by medical historians. But a work dealing with the correlation of the Vienna Medical School and British Medicine was lacking. I intend to stop this gap by this little volume, inspired by my affection for the Vienna School, to which I belonged for half a century, and animated by an admiration for the many pioneer achievements of British investigators and physicians.

The subject is a fresh one and my researches have brought to light many facts which emphasize the link which has existed between the medical profession in Britain and in Austria, as well as the extent to which British medicine through its literature and through personal contacts has influenced the progress of medicine on the Continent.

I should like to record my indebtedness to the Trustees of the Wellcome Research Institution, particularly to Sir Henry Dale and Professor T. R. Elliott and to the Director of the Wellcome Historical Medical Museum, Dr S. H. Daukes.

I also wish to express my thanks to the members of the staff of the Wellcome Historical Medical Museum for their valuable aid on many occasions and to the Hon. Librarian of the Royal Society of Medicine, Dr J. D. Rolleston, for having read my manuscript and made helpful criticisms.

MAX NEUBURGER

LONDON

April, 1942

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GERHARD VAN SWIETEN

1700-1772

CHAPTER I

VAN SWIETEN AND DE HAEN CONSIDERED SYDENHAM'S WORK AS THE IDEAL OF CLINICAL PRACTICE

THE OLD VIENNA SCHOOL, which was brought into existence by VAN SWIETEN's work for medical reform, was for decades the most celebrated stronghold for Boerhaave's doctrine of clinical observation and of the master of Leyden's therapeutic principles. Moreover, the VIENNA SCHOOL OF MEDICINE soon came into contact with British medicine through the writings and teaching of Boerhaave's disciples, VAN SWIETEN and DE HAEN.

This connection was to be an important factor in determining the direction taken by Viennese medicine in the eighteenth century, and later.

That sober empiricism, resting on the accumulation of detailed observations, which was characteristic of English medicine in the eighteenth century and which it has never lost, became the guiding star of the Vienna Medical School also. Its independent and unprejudiced spirit, combined with great power of observation, made it the type of clinical investigation, the example of the true clinical method.

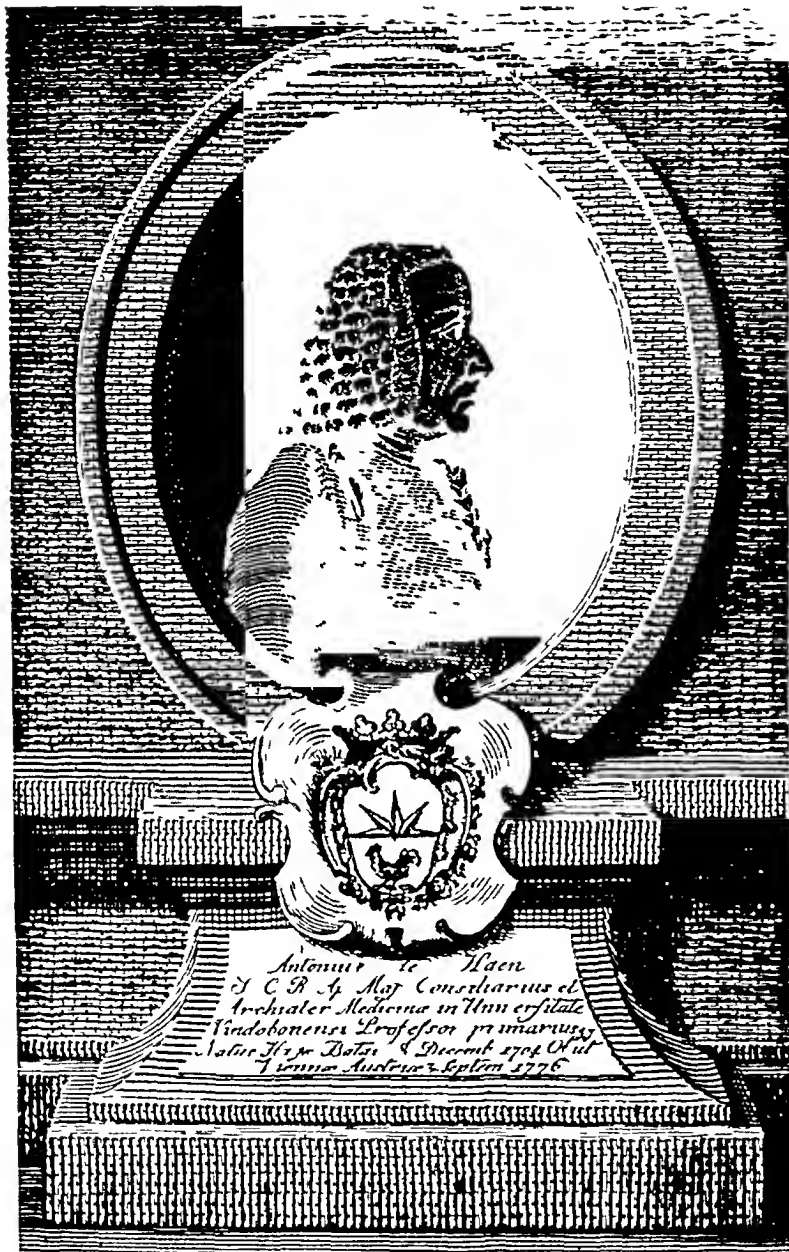
Boerhaave made use of the iatro-mechanical theories of PITCAIRN in his system of teaching and chose to follow Sydenham in his clinical investigation and treatment of the sick. He had the greatest admiration for the English Hippocrates and influenced his pupils in the same direction.

The disciples of Boerhaave, who as teachers and authors of standard works were bringing about the reform of medicine in Vienna, always considered SYDENHAM's work as the ideal of clinical practice. This is amply proved by the study of their writings. They also quoted numerous

observations and experiences of prominent British practitioners as well as their theories about diseases, and the experimental results of British investigators in medical science were not ignored

It may be emphasized that in VAN SWIETEN's chief work, *Commentaria in H. Boerhaave aphorismos de cognoscendis et curandis morbis*, Sydenham is repeatedly quoted in nearly every chapter. Van Swieten followed Boerhaave in inclining towards Sydenham's teleological conception of fever as a remedy of nature, and he therefore recommended a therapy which attacks the dangerous symptoms alone, and not the fever itself. He emphatically rejected the excessive use of sudorifics, which was a common practice at the time. Van Swieten's work remained a rich source of knowledge for the Medical School in Vienna until the beginning of the nineteenth century, and he quoted an impressive number of other British medical authorities besides Sydenham.

Anton DE HAEN, the former co-disciple of van Swieten, was called to Vienna in 1754 to take over the newly founded clinic. He, too, was an enthusiastic follower of Sydenham and regarded the clinical observation of the sick as the supreme criterion for all medical questions, giving to physiological science an advisory but not a decisive significance. De Haen himself often made experiments in the interest of the clinic, and in doing so he always took in consideration the relevant English literature. He made considerable improvements in medical science and clinical teaching by introducing exact measurements with the thermometer (Fahrenheit), by recording new diseases, by frequent and careful post-mortems before students, and by employing new therapeutic methods (electrotherapy). His methods as a teacher and as a practising physician were founded on the principles of Hippocrates, Sydenham and Boerhaave. Under his leadership the Viennese Medical School began to attract disciples from all countries.



ANTON DE HAEN

1704-1776

De Haen mentioned with great satisfaction that the therapeutic methods which he practised in the hospital had been noted with approval by the distinguished practitioner and experimentalist David MACBRIDE. But because he erroneously explained all petechial and miliary eruptions as mere artificial products following the treatment of fever patients by diaphoresis, etc., de Haen came into conflict with PRINGLE over the treatment of fevers by blood letting. In point of fact, the petechial fever described by Pringle, Huxham, Grant, and others had nothing to do with the form named "Febris miliaris" by the Viennese clinician.

One of de Haen's pupils, Anton STOERCK was the first since Thomas Willis and Wepfer to make experimental examinations of drugs and thus founded experimental pharmacodynamics. How highly his works were valued, is shown by the fact that Stoerck's writings on *Cicuta*, *Stramonium*, *Hyosciamus*, *Aconitum*, etc., were translated into English in 1760 and 1764, and that English authorities, e.g. Fothergill in his lecture on hemlock, refers to the Viennese scientist.

De Haen was one of the most persistent opponents of inoculation for small-pox, but the Empress Maria Theresia called Ingen-Housz, a Dutch pupil of Dimsdale, to Vienna for the inoculation of two archdukes and one archduchess. The satisfactory result of the operation, after an extensive series of two hundred cases, prepared the way to the practice, which, particularly in the hands of Stoerck and Locher, was given a thorough application and investigation.

In contrast with de Haen, his successor, Maximilian STOLL promoted the spread of inoculation for small-pox, and he himself performed it twice a year in the presence of his pupils. Stoll, who was one of the most beloved clinicians, brought the old (first) Vienna clinic to the height of fame, to him pupils flocked in crowds from far and near. Stoll accepted the maxims which Sydenham

had advanced when he was developing the idea of the "epidemic constitution." A number of physicians from the Vienna School busied themselves with epidemiology, e.g. Sagar, Chenot, Plenciz, and the epidemiological principles of Sydenham were held in veneration in Viennese medical literature almost into the middle of the nineteenth century.

The connection between the English medical circles and the old Vienna Medical School can be traced in the medical periodicals at the end of the eighteenth century and in the writings and letters of J. C. Lettsom, the founder of the Medical Society in London.

The greater part of Stoll's active career was contemporary with the reign of the Emperor Josef II, a monarch who took a real interest in medicine from the noblest motives of humanity. Thanks to him, the General Hospital was opened in 1784 and the clinic, which was originally in the "Burgerspital," and then in "Dreifaltigkeits" or "Unirtes Spital," was transferred into the *Allgemeines Krankenhaus*. For the purpose of training competent military doctors the Emperor founded a school which in 1785 was established in a magnificent new building and granted the right and ranks of a University, the so-called *Academia medico-chirurgica Josephina*, the "Josefinum." This building contained lecture rooms, a library, and a collection of anatomical wax models made in Florence, and was connected to the Military Hospital of one thousand two hundred beds. The teaching was devoted to all branches of medicine, with particular attention to surgical cases. The Emperor also recognized the necessity of sending gifted young doctors abroad, especially to France and England, where surgery and obstetrics had made a greater progress than in the German countries. Thus, he provided HUNCZOVSKY and BOER with travelling expenses and instructions, which made it possible for them to acquire the best education abroad, and ensured their return as teachers. Hunczovsky was sent



MAXIMILIAN STOLL.

1742-1788

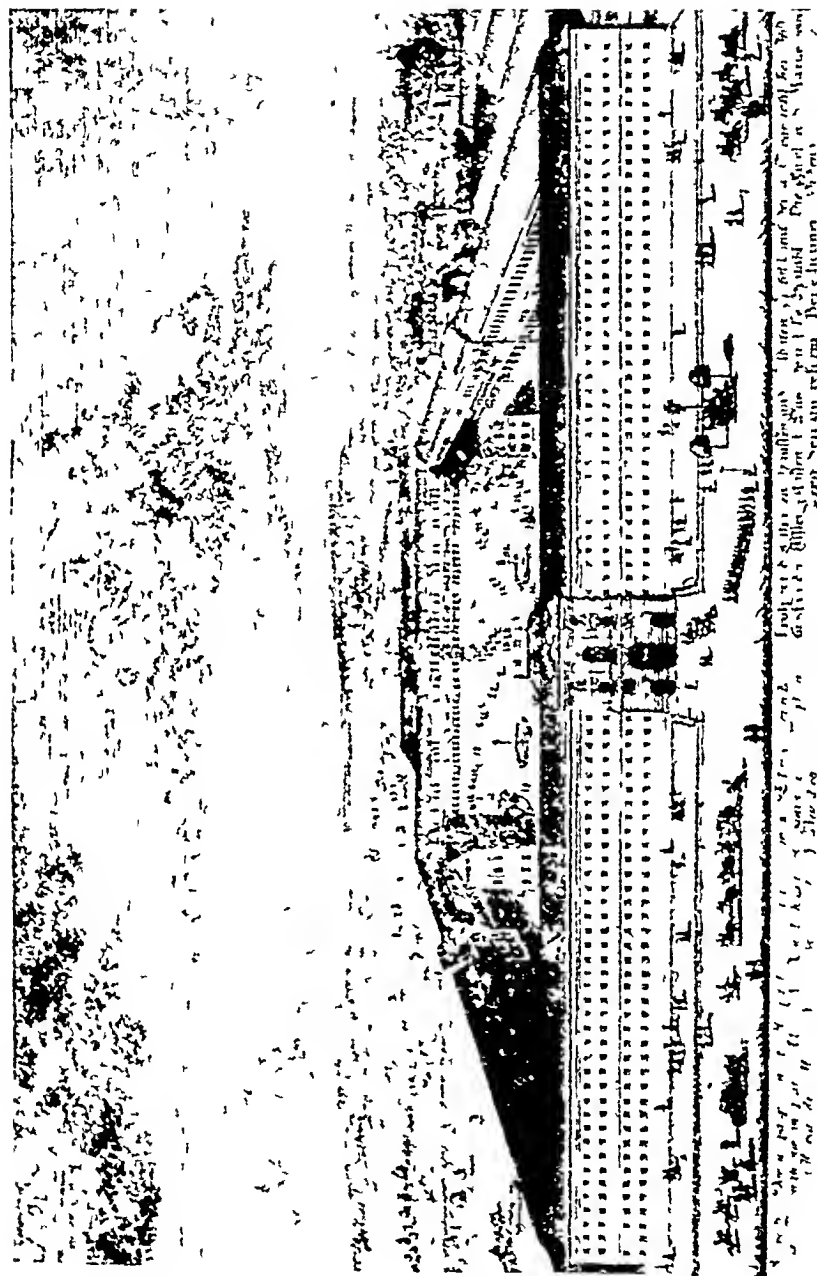
in 1777 to France and England, to visit the hospitals of these countries. On his return he published his *Medicinischchirurgische Beobachtungen auf Reisen durch England und Frankreich*, in which are contained valuable reports on methods of healing, such as Pott's treatment of kyphosis. Hunczovsky, who became teacher of surgery at *Academia Josephina*, translated Rob Hamilton's *The Duties of a Regimental Surgeon* into German.

As regards obstetrics, theoretical instruction had been introduced in Vienna as a result of van Swieten's efforts, and the lectureship was given to CRANTZ, who was mainly influenced by SMELLIE, being an advocate of natural midwifery. His successor Rechberger also clung to the conservative view, i.e. that parturition should be left as much as possible to the power of nature.

BOER, formerly assistant of Rechberger, left Vienna in 1785, and after visiting Brussels and Ghent, he went to Paris, where he stayed for fifteen months, and then to London, where he remained about a year. There he paid daily visits to the great Westminster Lying-in Hospital, of which Leake was chief. Boer did not neglect to visit the other hospitals and became acquainted with Osborn, Denman, Clarke, Baillie and others. An excursion to Edinburgh put him in touch with Aitken, and in Dublin he met Dease. In 1789 Boer was appointed extraordinary professor in Vienna and took over the control of one section of the General Hospital for poor expectant mothers with instruction to give practical teaching.

The numerous reforms in health services and the foundation of humanitarian institutions, which Josef II inspired, aroused the interest of the English philanthropist John HOWARD, who travelled extensively in order to study the hospital and prison system of Europe. In his work, *An Account of the Principal Lazarettos of Europe, etc.*, he discusses, among others, the Viennese institutions, which he visited in 1786. The General Hospital, the "new" Tower for Lunatics, the Military Hospital, etc. Howard

also had the opportunity of putting before the Emperor many of his critical observations and suggestions for improvement. It may be mentioned in this connection that in 1799 MASON GOOD'S work, *A Dissertation on the Diseases of Prisons and Poor Houses*, was translated into German by the distinguished Viennese physician, Dr Count HARRACH. He was received with particular honour when he visited England.



ALLGEMEINES KRANKENHAUS

PLENCK AND WILLAN

THE literary output of J J v PLENCK, professor at the Academia Josephina, was enormous, covering such branches of medicine as pharmacology, toxicology, forensic medicine, surgery, dermatology, venereal diseases, ophthalmology, children's diseases, and the many contacts with British medicine deserve comment. For example, there appeared in London, in 1767, an English translation of PLENCK'S work on *A new and easy method of giving mercury to those affected with the venereal diseases*, and only a year later a second edition was called for. By means of his work, *Doctrina de morbis cutaneis*, PLENCK became the founder of the systematic method in dermatology. His idea of basing *the classification of skin diseases* solely on their external clinical signs was developed by Robert WILLAN in his celebrated work, *Description and treatment of cutaneous diseases* (London, 1798-1808), a book which had the widest circulation in all European countries, where it became known in the edition published by his friend Thomas BATEMAN under the title, *Practical synopsis of cutaneous diseases according to the arrangement of Dr Willan* (London, 1815). Plenck's ophthalmological work, *Doctrina de morbis oculorum* (Vienna, 1777, 1783), was extensively used by ROWLEY for his *Treatise on the 118 principal diseases of the eyes and eyelids* (London, 1790). In 1769 Plenck had translated Malcolm Flemyng's *Treatise of the nature, cure, etc., of the corpulence* (London, 1760).

The increasing interest in British medical literature can also be followed up in Viennese periodicals, e.g. the *Medicinishe Chronik*, the *Medizinisches Archiv von Wien und Oesterreich*, containing reviews of the works of

Keate, Falconer, Jenner, Cruikshank, John Brown, and others

Most outstanding among the manifestations of humanitarian efforts in the last decades of the eighteenth century is the greater concern which began to be shown for the preservation of the health of children and the treatment of their diseases. Pediatrics had already received literary representation in monographs at an early date in England, e.g. in writings of Phaer, Whistler, Glisson, Harris, Pechey, Francis Home, Cadogan, Fothergill. But George ARMSTRONG was, moreover, the first to create, by great sacrifice of time and effort, an *institution for treating the sick children of the poor*. In 1769 he established the first "Dispensary for the children of the poor" in London. Here Armstrong had rare opportunities for clinical observation and post-mortem investigation, the results of his studies being printed in the later editions of the work on children, originally issued in 1767 with the title, *An Essay on the Diseases most fatal to infants, to which are added Rules to be observed in the nursing of children, with a particular view to those who are brought up by hand*. Armstrong was ahead of his age and did not possess the personality to impress his ideas on the rich and powerful. The Dispensary was active until December 1781, when it was closed for lack of funds.

A fate similar to Armstrong's was experienced by F. J. MASTALIER who, in 1787, founded in Vienna an institution on the lines of the London Dispensary for the children of the poor. But the Viennese "Kinderkranken Institut" outlasted him and survives today as the oldest institution of its kind in existence. GOLIS succeeded Mastalier as Director of the institute in 1793. Of the oldest Viennese pediatric literature one must mention, besides the works of Golis, the writings of Plenck, H. Boer, and the *Bibliothek für Kinderärzte* of Ahorner (Vienna, 1792). In the preface to the English translation of Golis's treatise on *Hydrocephalus acutus, or inflam-*

matory water in the head (London, 1821), the translator Rob Gooch writes as follows "At Vienna there is an Institute for the sick children of the poor, to which Dr Golis has been physician ever since the year 1793 In Germany he has a great reputation he has written the best book I ever read on the acute hydrocephalus " It must be mentioned here that Robert WHYTT's masterpiece of clinical observation was published in 1768, *Observations on the Dropsy in the Brain*

Jos Pascal FERRO, who was highly esteemed in connection with Austrian methods of sanitation, was the author of important works in which the influence of British medicine is especially prominent In the treatise, *Vom Gebrauch des kalten Bades* (Vienna, 1787, 1796), he praised the English because they used the cold bath much earlier than any other nation, and in his historical information he follows the work of FLOYER and BAYNARD, *Psychrolusia or, the history of cold bathing, etc* (London, 1706, 6th ed 1752) FLOYER had published as early as 1697 *An inquiry with the right use of the hot, cold and temperate baths in England* The epoch-making work of James CURRIE, *Medical reports on the effects of water, cold and warm, as a remedy in fever and febrile diseases*, was first published in Liverpool in 1797

In his work, *Über die Wirkungen der Lebensluft* (Vienna, 1799) FERRO followed the example of English authors in the therapeutic use of oxygen, which Priestley had first recommended in collaboration with Watt Thom BEDDOES had founded in 1798 a "Pneumatic Institute" at Clifton (Bristol), where the young Davy worked as an assistant Another disciple of "pneumatic medicine" was ROLLO In 1801 there appeared in Vienna a German translation of Rollo's monograph on diabetes *An account of two cases of Diabetes mellitus* (London, 1797)

While De Haen and Stoll had exclusively supported Humoral pathology, the third great clinician of the old Viennese School, Johann Peter FRANK showed at least

during the first years of his activity in the "Allgemeines Krankenhaus" a strong inclination towards the revolutionary system described by John BROWN in his *Elementa medicinae* (Edinburgh, 1780) After making a critical examination of the theoretical side of the Brunonian doctrine, Frank did not hesitate to put it to the test at the sick bed His own independent reflections had already made him recognize the truth of *Solidism* and to doubt the one-sided Humoralism, but he was never blind to the faults and imperfections of Brown's system In later years Frank seems to have abandoned Brownianism entirely, in his medical handbook, *De curandis hominum morbis epitome*, Frank shows himself a worthy follower of Hippocrates and Sydenham He reminds us also in many ways of CULLEN, but far surpassed him in the versatility of his ideas Thus he did not entirely accept Cullen's system according to which the "nervous principle is the proper life-giving element, and to the disturbance of which all diseases can be traced" Nevertheless Frank paid special attention to diseases of the central nervous system earlier than any other continental clinician, and was the founder of the pathology of the spinal cord Frank's classification of diseases is also reminiscent of Cullen's

Josef FRANK, who was at first at Pavia as his father's assistant and then in Vienna as chief Physician in the "Allgemeines Krankenhaus," made great propaganda for Brown's system, however, it becomes evident in his later writings that as his experience increased, he gradually deserted the Brownian doctrines in many respects That was due to a visit made in 1803 to the English and Scots, who in a country where simple observation is the rule, abhor all sophistic system Jos Frank wrote a report of this visit *Reise nach Paris, London und einem grossen Theile des ubrigen Englands und Schottlands in Beziehung auf Spitaler Versorgungshäuser, etc* (2 vols, Vienna, 1804-5, 2nd edition 1806) Frank, coming into contact



JOHANN PETER FRANK
1745-1821

with many British physicians and visiting medical schools, has particular praise for the Edinburgh clinic because there the pulse was taken with the watch and the temperature with the thermometer. He discussed various medical questions with Gregory, who pronounced a very unfavourable judgment on Brown's system and esteemed HEBERDEN most highly.

The most important of the works published in Vienna, which attacked Brownianism was the *Analyse der neueren Heilkunde* by the professor of pathology, Phil. Carl HARTMANN (Vienna, 1802). During J. P. Frank's directorship of the General Hospital in Vienna vaccination was introduced. It was first FERRO and then the enthusiastic DE CARRO, particularly the latter, who led the agitation in support of vaccination. De Carro received his medical education in Edinburgh, he did not confine his activities to Vienna, but instructed physicians in the rural districts and provinces of Austria, and sent vaccine to various German towns, and even to the Orient, via Constantinople. Besides De Carro, several Viennese physicians supported the introduction of vaccination. As an acknowledgment of De Carro's services, Ed. JENNER made him a gift of a silver box bearing the inscription "*Jenner to Jean de Carro*". In 1802 J. P. Frank insisted that a series of vaccinations should be performed in the Vienna General Hospital before a commission, and that the official attitude to vaccination should depend upon the results obtained. This suggestion was carried into effect on the 1st of September, 1801, and since, by November 12th, no ill-effects of the inoculation of Variola could be found in thirteen out of the twenty-six children, the government, on March 20, 1802, issued a circular recommending cowpox-vaccination.

Jenner's famous work, *An Inquiry into the causes and effects of the Variola vaccinae*, was translated into Latin by CARENO in Vienna. *Disquisitio de causis et effectibus variolarum vaccinarum. Ex anglico in latinum conversa ab*

Aloysio Careno (Vienna, 1799) In one of his letters (Letter 201) LETTSOM wrote concerning vaccination “ had my young friend been informed that wherever the cow-pock has been generally admitted, the small-pox has been eradicated That in Vienna two children only had died in eight years of the small-pox, and those caught it on the Danube, that in consequence of general vaccination in that city, the number of blind children has proportionately diminished ”

CHAPTER III

CHARLES BELL AND PROCHASKA

AT the end of the eighteenth and the beginning of the nineteenth century, three other members of the old Vienna Medical School besides the illustrious Joh Peter Frank earned an enduring place of honour in the history of medicine. They were the anatomist and physiologist PROCHASKA, the master ophthalmologist BEER, and the reformer of obstetrics BOER. Each of them is more or less connected with British medicine.

Georg PROCHASKA not only had a thorough command of contemporary knowledge, but looked far beyond it to facts which were only confirmed by investigators many years later. With regard to the doctrine of *reflex action*, i.e. movements of a purely mechanical and involuntary nature, Prochaska stands between Rob Whytt and Marshall Hall. He made experiments very similar to those of Whytt on decapitated frogs, and like him too, he pointed out the obviously *purposeful nature of the movements resulting from peripheral stimuli*. Prochaska regarded the *spinal cord* as the seat of the reflex arc. The final confirmation of these ideas was presented in Marshall Hall's treatise, *The reflex functions of the medulla oblongata and medulla spinalis* (1833).

The prerequisite for the correct understanding of the reflex phenomena was, however, the recognition of separate motor and sensory nerve paths, which was first made by Charles BELL in 1811 in his treatise, *Idea of a new anatomy of the brain, submitted for the observations of the author's friends*, and with still greater clarity in 1821 in his lecture read before the Royal Society "On the nerves, giving an account of some experiments on the structure and functions, etc." The enunciation of

Bell's Law, according to which the ventral roots subserve motor functions, and the dorsal roots sensory functions, was for the time being based on experiments which provided a functional explanation of the anatomical arrangement of spinal nerve roots, such as *the relation of the Portio major to the Portio minor of the Trigeminal nerve*

It is PROCHASKA who has the credit of having pointed out, at first in a tone of scientific curiosity that only the dorsal root of spinal nerves passes through the intervertebral ganglion, while the ventral root has no connection with the ganglion. Little notice has previously been taken of this fact, that the *fifth cranial nerve, the Trigemimus, was analogous with the spinal nerves* in passing a double root, one dorsal and ganglionated, and one ventral which passes directly into the core. No lesser man than Charles Bell has remarked upon the importance of the Viennese investigators theory, although his fundamental work was not directly inspired by Prochaska's ideas. Passages bearing on this theme are to be found already in Prochaska's treatise *De structura nervorum tractatus anatomicus* (Vienna, 1799), and further in his *Disquisitiones anatomico-physiologicae* (Vienna, 1812), in which he mentions centrifugal and centripetal conduction. Prochaska's works were published in English, together with the works of Unzer, by the Sydenham Society (London, 1851).

Georg Josef BEER was not only the most celebrated ophthalmologist of his time, but one of the greatest of all times. It is upon his teachings that the fame of the University of Vienna in this speciality depends, in them the ophthalmology of the Vienna school took its origin. The most outstanding of his British pupils were James WARDROP and William MACKENZIE. Wardrop, who continued his studies in Vienna under J. P. Frank, Prochaska and Beer, attempted a work on the pathological anatomy of the eye and connected with it discussion on individual forms of disease in his *Essay on the morbid anatomy of the human eye* (Edinburgh, 1808, 1818, 1819-20, 1824).



LUCAS JOHANN BOER
1751-1835

Mackenzie, one of the most distinguished eye specialists in the first half of the nineteenth century, had his practice first in London and later in Glasgow, where he was professor in the Eye Hospital. He was very successful with his text-book *A practical treatise on the diseases of the eye* (London, 1830, 1833).

Lucas Johann BOER, who became ordinary professor in 1808 of practical obstetrics in Vienna, soon raised his department in the "Allgemeines Krankenhaus" to a leading position in Europe. For more than three decades numerous pupils from all countries gathered round the master, among them the most celebrated obstetricians of later times. As to practical work, BOER was responsible for sweeping reforms. His most important achievement was the so-called *natural obstetrics*, for no one before Boer left the act of birth to nature to such an extent and with so much resolution. He not only surpassed the French obstetrician Solayrès de Reñhac, who distinguished himself favourably from his compatriots of the time by his appreciation of those stages in the act of birth which can be left to nature—Boer even surpassed his British masters. For the expectant method had been handed down in Britain as a tradition from Harvey to SMELLIE and William HUNTER.

SMELLIE is most distinguished in connection with natural birth (of 1,000 births, 990 are said to occur with only ordinary assistance), and the study of the mechanism of birth. Smellie's pupil, W. HUNTER, showed a definite aversion from the use of obstetric instruments, especially the forceps. He said of them that on the whole they had done more harm than good.

On account of the importance of the treatment of wounds, especially in the history of British surgery, the Viennese professor of practical surgery, Vincenz v. KERN should be mentioned and his treatise, *Avise aux chirurgiens pour les engager d'adopter une méthode dans pansement des blessés* (1809). Kern opposed the contemporary craze for ointment and plaster dressings, and stressed the

value of keeping the wounds *clean* and treating them with water, he objected to the stuffing of the wounds with "charpie," etc., and to the use of pressure to remove pus. To him the Vienna school owes the credit for the foundation of the "Opérateur-Institut" for the training of surgeons (1807).

Frank had no quite worthy followers in the medical clinic during the first decades of the nineteenth century. Val v HILDENBRAND was the only one of note. However, the Viennese clinicians of this period must be given the credit of having kept medical theory free from the fantastic speculations of German "natural philosophy." They presented their pupils in word and writing with experiences based on cool observations, and used and recommended to them the most practicable and simple methods of cure. They distinguished themselves by their freedom from abuse of venesection, so flourishing at that time, particularly at Paris, and in general by their *expectant treatment*.

The expectant method was nowhere more esteemed than in the General Hospital at Vienna, and already in the first decades of the nineteenth century, foreign physicians had expressed their surprise at the simplicity of the therapeutic methods, seldom involving blood-letting, which were practised at the clinic under the directorship of v Hildenbrand and Raimann, and still more by some senior physicians in their departments. BOER, the reformer of obstetrics and the surgeon v KERN, with his drastic simplification of wound treatment, demonstrated what Nature can do, and once more *reinstated the doctrine of the healing power of nature in its rightful place*.

While it was still in its final flowering Richard BRIGHT saw the old Viennese medical school during the brilliant days of the Viennese Congress, and he gave an interesting description of it. In 1814 he started a continental tour through Holland and Belgium to Berlin, Vienna and Hungary. The following passages which concern our subject are extracted from Bright's travel journal, *Travels*



RICHARD BRIGHT
1789-1858

from Vienna through Lower Hungary, with some remarks on the state of Vienna during the Congress in 1814 (Edinburgh, 1818) "My attention was naturally drawn in a peculiar manner to the magnificent General Hospital, where the medical lectures of Hildenbrand, the instruction of Boer, and the surgical practice of Kern afford great attraction to those who are interested in such pursuits" There follows a description of the "Allgemeines Krankenhaus," in which such details as the cost of maintenance and the methods of ventilation are given. "The clinical wards are greatly superior to the others, they are situated in a separate building in one of the squares of the hospital, where the Professor HILDENBRAND, under whose care the patients are placed, resides This very able physician is the worthy successor of the celebrated STOLL and FRANK He devotes himself very assiduously to the improvement of the students, whose education, in the practical parts of medicine, he superintends He visits the patients, in company with the pupils, as early as seven o'clock in the morning, and afterwards delivers a very excellent course of medical lectures in Latin Professor Beer likewise lectures in the hospital, and gives his clinical instruction in a large ward set apart for diseases of the eye "

"For assisting in the medical education of the students there is a considerable collection of anatomical preparations, both at the hospital and at the university And at the *Josephine medico-chirurgical Academy* is to be seen a most splendid collection of anatomical casts in wax, made by the skilful Florentine artists, representing, in the minutest detail, all the parts of the human body, with their anatomical structure fully displayed, and, where requisite, the magnified representation of the parts accompany those of the natural size There is yet one more cabinet of this class of preparations, which is particularly worthy of attraction This is the museum of Professor PROCHASKA, which contains the most minute injections of the vessels of the human body in existence "

William MACKENZIE, the famous oculist, published in 1818 and 1819 two articles in *The Quarterly Journal of Foreign Medicine and Surgery* under the title "Sketches of the Medical School of Vienna." In his preface he says of the Vienna University "It has risen in reputation amongst the catholic Universities, so that it now occupies, especially as a medical school, the very first rank." "Among the foreigners who came to Vienna in order to continue their studies are not only Hungarians, Swiss, Italians, Russians, Dane's and Dutch, but also French and English, and amongst them some who already had a medical practice, and even Professors of distant universities."

"It is chiefly from the admirable arrangement of the clinics for internal diseases, for diseases of the eye, and for lying-in women, and from the celebrity of the professors of these three clinics, that foreign students are attracted to Vienna."

Mackenzie gives great praise to the clinical instruction, which was considerably better in Vienna than anywhere else "We can scarcely conceive any improvement which could be made in the clinical education of physicians at Vienna. The system seemed to us to be perfect."

"It seemed as if the students were led by v. Hildenbrand into the private houses of his patients, and as if the pupils were not learning a lesson in hospital, but beginning to practice for themselves with the advantage of hearing an experienced and able practitioner with whom they might consult."

Mackenzie was also one of the few who understood Kern's method of wound treatment, and also recognized his other merits. Finally Mackenzie discusses the unusually high standard of Austrian hygiene and forensic medicine, of which at that time BERNT was an excellent teacher and expert. We must note that *regular inquests* were first established in Austria. Bernt gained special fame through his proposal of an hydrostatic lung test for determining whether a child had been born alive.

or dead Bernt also published lectures on First Aid With regard to the Viennese literature on *First Aid*, papers of de Haen, Stoll, Schosulan, and others, must be considered, and the papers of the London Society for treating the victims of accidents—"The Royal Humane Society" founded in 1774 by Dr Th COGAN—written by Fothergill, Goodwyn, Johnson and Kite, were translated into German It was J P FRANK who first established a kind of casualty station in the General Hospital

The recognition of the old Vienna medical school had been complete and widespread, but the medical world left the most significant and influential achievement of any Viennese physician unnoticed or underestimated for several decades, namely the invention of *Percussion* as a means of examination by Leopold AUENBRUGGER, by which *physical diagnosis of diseases of the chest* was for the first time placed on a firm basis

Neither van Swieten nor de Haen recognized the value of this method Only Stoll made limited use of it, and reported cases in his works which proved the diagnostic success of percussion, but very few of Stoll's numerous pupils at German universities used it J P Frank, too, by no means recognized the fundamental significance of percussion and did nothing to encourage its use

After having made tests over a period of seven years, Auenbrugger published his method in the form of a summary in his work, *Inventum novum, ex percussione thoracis humani, ut signo abstrusos, interni pectoris morbos detegendi* (Vienna, 1761) This work presents in ninety-five pages an account of percussion, of sound in normal and abnormal conditions, and of pectoral fremitus His percussion records, together with his pathological and anatomical findings, and reports of the experiments made in establishing the method, are all very important But nearly half a century passed before this method gained support Inspired by the study of the works of the Viennese clinician Stoll, CORVISART was the first to give percussion serious attention, and he practised it diligently

at his clinic at Paris. In 1808 he produced a new edition of Auenbrugger's *Inventum novum*, after having put it to the test for twenty years. He combined it with a French translation of the Latin original and a commentary referring to numerous clinical histories. Corvisart's pupil—the Breton LAENNEC—became the creator of clinical auscultation by means of the stethoscope. He combined this method of examination with Auenbrugger's system of percussion, the significance of which he recognized for pneumothorax, pulmonary emphysema and tuberculosis of the apices of the lungs.

As to Britain, percussion was introduced later than in France, but still earlier than in Austria and Germany.

In 1821 John FORBES had published an English translation of Laennec's work *De l'auscultation médiate ou traité du diagnostic des maladies des poumons et du coeur etc*, and quoted in the preface the opinion of Corvisart and Laennec on percussion. In 1824 he followed up the subject by a translation of Auenbrugger's work, which was still comparatively unknown in England. FORBES' translation of Auenbrugger's work into English appeared under the title *Original cases illustrating the use of the stethoscope and Percussion in the Diagnosis of Diseases of the Chest, on percussion of the chest, being a translation of Auenbrugger's original treatise, entitled "Inventum novum etc," and of a selection of the more important commentaries of Corvisart on that work* (London, 1824). Forbes recommended Auenbrugger's work in the following words: "Independently of its high value as being the original records and, even at this day, still the best record of the principles and practice of percussion, this little treatise merits the regard of practitioners for the numerous original and profound pathological truths and descriptions contained in it."

Two other doctrines, not accepted by the Vienna school, but also derived from the older Viennese medicine, were *Animal Magnetism* and the *Cranioscopy* or *Phrenology*. Both MESMER and F. J. GALL, who were Viennese phy-

sicians, found recognition abroad, particularly in Paris, although not without some opposition

Animal Magnetism at first attracted little attention in Britain. But when, in 1833, J. C. Colquhoun's English translation of the favourable report of the Paris Commission was published and then re-published in the same author's *Isis relevata* (1836), it aroused the attention of British physicians to this subject (Ashburner, Herbert Mayo, J. Elliotson, J. Forbes)

As regards Gall, his pupil Spurzheim, who resided in England from 1813 to 1817 and from 1821 to 1828, was instrumental in introducing the doctrine of the Viennese anatomist. The term "Phrenology" was coined by Spurzheim himself, and was never accepted by Gall. The agitation of Spurzheim led to the foundation of phrenological societies at Edinburgh, London, etc., and even in India.

Both Viennese physicians, Gall and Mesmer, were pioneers. Gall's doctrine of the "organs of the brain" led to the localization of brain functions. "Animal Magnetism" or "Mesmerism" developed into hypnotism. The works of James BRAID, *Practical Essay on the curative agency of Neuro-Hypnotism* (1842) and *Neurypnology, or the Rationale of nervous sleep considered in relation with Animal Magnetism* (1843) were of fundamental importance.

England was the first country in which the care of the insane was attempted on a large scale. In the middle of the eighteenth century a clinic—called St. Luke's—was founded in London. Although indeed it was very primitive, we must remember that on the Continent at this time prisons, mad-houses and houses of detention were still the only known methods of treating these unfortunate people. The success of the St. Luke's foundation induced the Society of Friends, a short time afterwards, to build an asylum of their own for such of their co-religionists as were mentally afflicted. This was the "Retreat" at York of which William Tuke, in 1793, was the actual founder.

CULLEN was the creator of the theory and practice of the treatment of the insane in Britain. The authors Th Arnold, Perfect, Harper, Faulkner, Pargeter, Haslam, Crichton, were followed by Crowther, Marshal, Cox, Burrows, Knight, Lyer, Combe, Prichard, Ellis. In 1823 Alexander Morison commenced a course of lectures on mental diseases at Edinburgh, and in 1826 he began to give lectures in London.

In Vienna, the mentally diseased were kept at the "Marxer Spital" until 1784, when the so-called "Narren-turm" (Fools' Tower) belonging to the Allgemeines Krankenhaus was opened. The first man in Austria to produce a work of any significance in psychiatry was the poet-physician Baron Ernst VON FEUCHTERSLEBEN with his *Lehrbuch der aerzlichen Seelenkunde* (Vienna, 1845). He was the first to give lectures in Vienna on Medical Psychology and Psychiatry and his text-book was received with great enthusiasm in Germany, Holland and England. Feuchtersleben quoted in his text-book a lot of British authors. The English translation was published by the Sydenham Society with the title *The Principles of Medical Psychology by Baron Ernst von Feuchtersleben, translated from the German by the late H. Evans Lloyd, revised and added by B. G. Babington* (London, 1847).

After Frank's and v Hildenbrand's leadership the Viennese medical clinic decayed and for the time being, the Parisian school unquestionably led the world in medical matters. But at the end of the 'thirties a new school arose at Vienna, the chief representatives of which, Rokitsky and Skoda, laboured particularly after the method of the French school of pathological anatomy and diagnosis. C. A. Wunderlich, a young instructor in Tübingen, wrote as early as 1841, "I believe that I do wrong to no one when I style by the name of the young Viennese school the peculiarities of these able investigators."



CARL FREIHERR VON ROKITANSKY
1804-1878

CHAPTER IV

ROKITANSKY AND SKODA

A CONNECTION between the old Vienna school, distinguished in its day for its soberness and its Hippocratic tendencies and *the so-called second or new Vienna medical school, formed by the pathological anatomist Karl Rokitansky, and the diagnostician, Joseph Skoda*, is not directly demonstrable. At most, it is manifest that certain common points of both schools remained, inasmuch as the representatives kept themselves free from the systems which flourished during the first third of the nineteenth century in Germany, and practised a simple old Vienna expectant therapeutics.

Important reforms in the conception of disease, and in methods of clinical examination—principally a result of the work of CORVISART, LAENNEC and their pupils—were brought about by detailed study of pathological anatomy, and by the development of percussion and auscultation. The acceptance of these outstanding achievements occurred comparatively late in Vienna, and was by no means due to the official leaders of the medical clinic, but to two young investigators in the General Hospital, the prosector Rokitansky, and the assistant physician Skoda, both deeply influenced by the recent French medical literature.

Rokitansky, beginning as assistant in the Institute of Pathological Anatomy, which was founded in the General Hospital under the influence of J. P. Frank, became prosector in 1832, extraordinary professor in 1834. Inspired by the works of Meckel, Lobstein and Andral, he plunged with enthusiasm into studies similar to those being carried out in Paris, and published from 1832 onwards essays following one another in quick succession,

starting from observations made at autopsies, expanded to discuss general and pathological topics. The bodies of all those who died in the huge General Hospital at Vienna passed through Rokitansky's hands. He had command of an incomparable amount of material for pathological study. Never had the anatomical changes in disease been so thoroughly investigated as by Rokitansky, structure, correlation, stages of development and frequency were particularly carefully studied. In the Institute of Pathological Anatomy new life had been instilled since Rokitansky had come to work there, doctors from foreign parts assembled year by year in greater numbers.

Next to Rokitansky, SKODA was the centre of attraction of the rejuvenated Viennese school. Like Rokitansky, he was acquainted with the chief works of the Parisian medical authors, and had read much about percussion and auscultation. But there was no one in Vienna who could give him practical instruction in these subjects, so he had to cope with enormous difficulties. They compelled him to study the new methods of diagnostics from the first elements. As assistant physician in the General Hospital from 1833, Skoda used opportunities for self-instruction and original research, he percussed, he auscultated, and then went to watch Rokitansky's post-mortem examinations. He put to use at the sick-bed what Rokitansky had discovered at the dissecting-table.

In 1839 there appeared his *opus magnum*, the classic, epoch-making work, *Abhandlung ueber Perkussion und Auskultation*, which was the fruit of a series of penetrating preparatory studies. In spite of its small size and unassuming presentation, its content marked a turning-point in the history of medicine, it constituted the foundation of modern physical diagnosis. Skoda's merits were attracting more and more attention, and he was becoming renowned for his successful diagnosis. In 1840 he obtained the position of prescribing physician to a section of the General Hospital assigned to diseases of the chest as a



JOSEF SKODA
1805-1881

specialty The next year Skoda became a physician-in-chief and received in addition the sections for internal diseases and for diseases of the skin, being thus enabled to continue his scientific investigations upon a broader basis, and being likewise provided with extensive opportunities for imparting instruction Of the many who came to learn from him more were physicians already established in practice than young students, more were foreigners than compatriots

By his views on physical diagnosis he showed himself an independent spirit, who far outstripped and overtopped scientifically the Parisian diagnosticians Trying to develop the purely empirical French doctrine of physical signs into a strictly scientific system of physics, SKODA substituted categories of sonorous phenomena based upon the physical constitution and configuration of the organs and tissues He made his famous physical scale the chief basis of percussion, and arranged sounds into the classes 1 From full to empty, 2 From clear to dull, 3 From tympanitic to non-tympanitic, 4 From high to deep He likewise brought auscultatory phenomena under the laws of acoustics Moreover, he always went to work upon an experimental basis, studying particularly upon the cadaver the legitimate conditions of the diagnostic phenomena, so as to employ these as the basis for judging the physical variations from the norm in the sick Great credit is also due to Skoda for his elucidation of the phenomena of cardiac diseases In his treatise on percussion and auscultation one finds a clear distinction between deficiencies of the cardiac valves, insufficiency and stenosis of single valves, and there are also exact details of the localization and qualities of the heart sounds

ROKITANSKY succeeded in classifying the manifold anatomical lesions into a few types, and he proved that certain clinically observed groups of symptoms showed certain anatomical lesions The comparison of different

stages of the same process by means of post-mortems opened the way for a real history of disease to be constructed from the records of necropsies, and allowed the possibility of cure or natural healing to be discussed scientifically. After the publication of valuable monographs Rokitsansky's comprehensive *Handbuch der pathologischen Anatomie* appeared 1842-1846, and this work became the cornerstone of medical science on account of the breadth of experience, the keenness of observation and clarity of presentation there displayed. It transformed pathological Anatomy into anatomical Pathology in the service of the clinic, and brought to notice the healing process of nature as well as the limitations of the medical art.

Rokitsansky became full professor in 1844, Skoda in 1846. They were surrounded by a retinue of men who collaborated with them in full acceptance of their outlooks. Owing their fame mainly to the favourable judgment of foreign physicians, the leaders of the new Vienna Medical School fulfilled their mission so well that the clinic and the Pathological Institute of the "Allgemeines Krankenhaus" became for decades the centre on which the eyes of the medical world were focussed. At this time there was a widespread feeling that no European doctor's education was complete unless he had spent a considerable period of study in Vienna.

The important researches and observations of ROKITSANSKY and SKODA were first made known to the British medical profession by J. J. DRYSDALE and J. R. RUSSEL in their articles in the *Edinburgh Medical and Surgical Journal* (July 1841, Jan. 1842), and in their edition of John FLETCHER's *Elements of General Pathology* (Edinb., 1842). With regard to the "Typhous Matters," the Tubercles, the remarkable changes that the internal surface of the skull undergoes during pregnancy, the editors derived the description from ROKITSANSKY. "In addition to the testimony of LAENNEC, ANDRAL, LOUIS, NASSE,

CARSWELL, HOPE, SIR I CLARK, and many others, ROKITANSKY observed that tuberculosis was beyond all doubt curable, as is demonstrated from observations by no means unfrequently made on the bodies of those, some of whom had previously suffered under suspicious pulmonary affections and had ultimately recovered” “From the earliest times a vague idea had prevailed that two diseases could not co-exist in the system This opinion was thus far modified by JOHN HUNTER who stated that no two actions from two different morbid poisons can go on together at the time in the same part or the same constitution Later observations, while they have shown this statement, as expressing a general law, to be erroneous, have at the same time indicated that certain diseases exert upon others an opposing influence, in the way of the one arresting the course or modifying the nature of the other ” “But these and other isolated facts are not of a sufficiently definite character to have attracted much attention, and it remained for Professor ROKITANSKY to put this matter wholly in a new light, by establishing from a number of cases sufficient to render fallacy in the result almost impossible, that certain diseases never co-exist, as the presence of the one arrests the progress, or prevents the occurrence of the other” In the chapters of Fletcher’s work dealing with Auscultation of the lungs and the heart, DRYSDALE and RUSSEL substituted an account of the subject “which was taken from one of the most recent practical works on auscultation, viz that of Dr SKODA of Vienna ” “The peculiarity of these views, and our reason for adopting them, are their simplicity, precision, and practical value Dr SKODA’s views being based on experiment and observation alone, and his position affording the most abundant opportunities for their application, as well as his almost unrivalled skill as a practical auscultator, give greater weight to his opinions and observations than to any that have been published since the time of Laennec ” At the

same time as Drysdale and Russel, William WILDE, the famous ophthalmologist and aural surgeon of the Dublin School, also visited Vienna. We owe to him an excellent description of Rokitansky's and Skoda's activity in their earlier period, published in Wilde's book, *Austria its literary, scientific and medical Institutions, etc* (Dublin, 1843). In this he writes "In the years 1840 and 1841, I visited the most celebrated medical schools of the Continent chiefly for the purpose of improving my knowledge of ophthalmology, the high and ancient reputation of Vienna, with respect to the former subject led me thither, and the advantages it offered upon this and many other details of medical science were such as induced me to remain there during the greater portion of my foreign sojourn." "To the student or medical practitioner visiting Vienna I would particularly direct attention to the following subjects, for which this school is in an especial manner remarkable

"Pathological Anatomy On this subject Vienna offers the greatest advantage of any school in Europe, in the immense field for observation, in the rarity and extent of its museum, and in the teaching of its justly celebrated professor Doctor Carl ROKITANSKY

"Ophthalmic Surgery This school has been the very focus of this branch of science, for upward of half a century. Every oculist who would attain perfection in his art should spend some months in attendance upon the clinic of Jager and Rosas, and also avail himself of the opportunity of their private operating courses

"Diseases of the Chest SKODA contributed to the study of chest diseases in his attempt to classify normal and pathological chest sounds according to their quality and pitch. From his work has come an aid to the modern diagnosis, well known to medical students and physicians, the so-called 'Skoda's resonance,' the tympanic sound heard in pneumonia above pleural effusions. Dr Skoda's private clinique for diseases of the chest is per-



SIR WILLIAM ROBERT WILDE
1815-1876

haps the best school for acquiring a knowledge of the diagnosis of such affections that the foreigner can visit. As an auscultator Dr Skoda possesses an unrivalled reputation, and certainly his diagnosis of heart and lung affections is astonishingly correct.

"Skoda takes great pains with his pupils, and besides clinical instruction delivers several lectures during his courses upon the pathology of the circulating and respiratory organs from the cases that have died in these wards, indeed he is the only practical *teacher* in Vienna who pays attention to this subject. In these lectures, Dr Skoda also performs many curious physical experiments to explain the different sounds of the chest both normal and diseased, these, as well as the peculiarity of his opinions, will be found in his work *Abhandlung über Perkussion und Auskultation*. The school of pathological anatomy being also connected, and situated within the boundary of the Krankenhaus, here claims our attention. I need not now expatiate on its merits, the following description, though necessarily brief and sketchy, shows it to be at present the first in Europe."

"The pathological museum is to be found in the lower storey of the last square, adjoining the eye clinique, and may be entered from the passage leading to the deadhouse and dissecting room. It was commenced many years ago under the direction of Stifft, and was committed to the care of a prosector. Subsequently a professorship of pathological anatomy was established, and from the time that the present occupant of that chair, Dr Carl ROKITANSKY, was elected, may be dated the origin of its celebrity, and the rise of the young school of Viennese medicine. The splendid collection of morbid anatomy, undoubtedly the most interesting and extensive in the world, contained at the period of my visit one thousand three hundred and eighty-four preparations, some dry, and others preserved in spirits. The room in which they are placed is now, however, much too small, and in many respects ill-adapted

for them, and their arrangement is neither showy, elegant, nor judicious

“ The method of teaching pathological anatomy is conducted on much the same principle as that of the clinical instruction, and the school is chiefly frequented by foreign medical men. From eight to ten o'clock every morning the professor and his two assistants attend in the deadhouse, and carefully examine the majority of those bodies that have died of any particular or interesting disease, for to examine all, or one half, would be impossible within the time, generally from four to six bodies are opened daily, and a short notice of the symptoms, diagnosis, and treatment, etc., is sent with each cadaver. The professor, or one of his assistants, demonstrates the morbid appearances to the class, while the other (the junior), who sits at the rostrum, transfers his observation to the records of the museum. Any lesion of organs, or diseased appearances that may then present themselves are removed for preparation.

“ Professor Rokitansky delivers a public course of lectures upon pathological anatomy in the museum three times a week, on Monday, Wednesday, and Friday, from three to four in the afternoon.

“ The professor's delivery is by no means good, and his language difficult for those who are not natives of Germany to understand. Till within the last year or two, the very name of this distinguished pathologist was unknown in this country. His early writings consisted, for the most part, of scattered papers and monographs, published in the *Wiener medizinische Jahrbucher*. He has now, however, produced a book that must acquire for him European celebrity, the *Handbuch der pathologischen Anatomie*.

“ Rokitansky resides in the detached building of the first great square, and his private microscopic preparations are well worth visiting.

“ It is Rokitansky's private course that more par-

ticularly demands the foreigner's attention. In this he has several classes during the day, and from eight to twelve persons in each class. Those attending this course are daily required in their turn to perform an autopsy in the deadhouse—to describe the morbid and healthy appearances they meet with in each cavity or tissue—and answer the questions of the professor on the subject, as in the clinical wards of the hospital. The class having been thus grounded in the principles of the science, and their eyes made familiar with diseased structures for a month or five weeks, they are then conducted to the museum, where the professor explains the preparations systematically, and offers some observations upon the theory of pathology, as well as a résumé of his own peculiar views, and finally exhibits to his pupils his microscopic collection. The whole course lasts about six weeks, of which from eight to ten days are employed in the museum.

“ Different from all other pathologists, Rokitansky does not engage in the study or treatment of disease during life—he is not a practical physician, and seldom sees one or the many hundreds of cases whose bodies he dissects. This has been loudly exclaimed against by many, who say that here morbid anatomy has completely usurped the place of pathology—but though it presents an anomaly peculiar to this school, it undoubtedly possesses many advantages. We all know how difficult it is to dispossess the mind of any previously-conceived and long cherished idea, by which we either treat, or explain the phenomenon, of disease. We have all witnessed how frequently men generalize from a few peculiar cases, and how easily they find the morbid appearances to agree with the previous diagnosis, and if they do not find such, they fancy that they do. This has arisen from the physician who treats the case—the pathologist and the morbid anatomist being one and the same person, and the school of Vienna, previous to the present mode of

examining diseased structures, offered a well-marked example of this defect. The Protocols of the different medical sections teemed with numbers of cases whose post-mortem appearances fully corroborated their previous diagnoses, and yet but little advance was made in pathological science in those times. Furthermore, although I do not believe the diseases have altered, yet we now find pathological appearances quite different from what they were said to be prior to the introduction of Rokitansky's method. He first emancipated himself and his school from this fault, and now teaches general pathology, and morbid anatomy unconnected with, and unobstructed by, either diagnosis or theory, solely from the changes observable after death, and the solid ground of observation and experience.

" This school comes nearer to the principle aimed at by the immortal Laennec than any other since his day, and in many respects it surpasses the original.

" As a writer Rokitansky is much and justly admired, his language, ever forcible and explicit, expresses his meaning with all the clearness and perspicuity of which the German tongue is capable. He may now be regarded as the head and leader of the young school of Vienna, which the talent and labours of Skoda and a few others have so ably contributed to create.

" I cannot allow this opportunity to pass without recording the uniform civility and attention that I, in common with the rest of my countrymen, invariably experienced from the professors and assistants when visiting the different clinics of Vienna.

"In Vienna, his country and his diploma are the only passports the English student or physician requires to insure his admission, kindness and attention."

CHAPTER V

ROKITANSKY'S GREAT INTEREST IN THE BRITISH LITERATURE OF PATHOLOGICAL ANATOMY

ROKITANSKY's great interest in the British literature of pathological anatomy is indicated by the notes and additions which he contributed to the German translations of works by CHRISTISON and BENNETT. Christison's work *On Granular Degeneration of Kidneys and its Connexion with Dropsy, etc* (Edinburgh, 1839), appeared in a German translation under the title *Über die Granular-Entartung der Nieren und ihre Verbindung mit Wassersucht, etc aus dem Englischen uebersetzt von Joh Mayer mit Anmerkungen von C Rokitansky* (Vienna, 1841). The prize-winning work of James R Bennett, *The Causes, Nature, Diagnosis and Treatment of Acute Hydrocephalus*, also appeared in a German translation *mit anatomisch-pathologischen Zusätzen versehen von Rokitansky* (Vienna, 1844).

Actually, Rokitansky was anticipated by the British pathologists who, in conjunction with the Paris School, had given their attention to the scars of the natural healing process by means of studies in pathological anatomy. It was CARSWELL who investigated pulmonary tuberculosis from this point of view, and concluded that pathological anatomy nowhere gave a clearer proof of the possibility of healing a disease than in the case of phthisis. In 1832 CORRIGAN, in his work "On Permanent Patency of the Mouth of the Aorta or Inadequacy of the Aortic Valves" (*Edinburgh Medical and Surgical Journal*), laid the foundations of the doctrine of compensation of deficiency of the cardiac valves by hypertrophy of the ventricles. "In such circumstances Nature, to enable the

heart to perform the additional labours thrown on it, increases its strength by the addition of muscular fibre, and the heart thus becomes hypertrophied, in accordance with the general law that muscular fibres become thickened and strengthened when there is additional power required from it. Is this hypertrophy disease, or is it a *wise provision of nature* by which the organ is thus made equal to the increased labour it has to perform?"

CORRIGAN arrived at his conclusion that hypertrophy was a natural healing process as a result of his experience with the use of digitalis

Previous to this, interesting and original views into Nature's workshop were opened up by English surgeons. Of these, the most prominent was JOHN HUNTER, on account of his researches into the processes of wound healing and regeneration, and his teleological conception of inflammation as an effort of healing on the part of Nature.

In his work, *A Treatise on the Blood, Inflammation, and Gunshot Wounds* (which appeared posthumously in 1798), are to be found numerous most acute observations on healing *per primam intentionem*, inflammation, formation of pus, etc. He regarded the inflammation resulting from a wound as being at the same time the means of recovery. HUNTER considered the formation of granulations as one of the means which Nature employs to restore so far as possible to their original state the parts whose disposition, activity and structure have been completely changed. As early as 1789 James MOORE had written a similar treatise entitled *A Treatise on the Process of Nature in the Filling Up of Cavities, Healing of Wounds, etc.*

Following up the ideas expressed by HUNTER, observations and experimental results of the greatest importance were published on inflammation, on the sequence of events in spontaneous cessation of bleeding, on the effects of ligature on blood-vessels, on spontaneous healing of aneurisms, etc. Studies on the occurrence of the col

lateral circulation made a particular impression because here the purposive action of Nature seems to be brought out particularly clearly. Works to be considered here are JOHN THOMSON, *Lectures on Inflammation* (Edinburgh, 1814, 1818), JONES, *A Treatise on the Process Employed by Nature in Suppressing the Hæmorrhage from Divided and Punctured Arteries* (London, 1805), TRAVERS, *An Inquiry into the Process of Nature in Repairing Injuries of the Intestines* (London, 1812), and *Physiology of Inflammation and the Healing Process* (London, 1843), HODGSON, *Treatise on the Diseases of the Arteries and Veins* (London, 1815). Soon after their publication these works were translated into German. KREYSIG says in his preface of the German translation of HODGSON'S work "In it we become more intimately acquainted with the wonders of Nature in the healing of wounds and aneurisms of the arteries by opening up resources of self-healing which lie within the body. The English are justly proud of these discoveries, which were made by their compatriots, and which are important for both surgery and practical medicine."

It is apparent therefore that the ground had been well prepared in England for a just estimate of ROKITANSKY'S contribution to medical science. The SYDENHAM SOCIETY gave the best proof of the esteem which was felt in England for ROKITANSKY'S masterly achievement by producing an edition of the English translation of his handbook in four volumes, under the title *Rokitansky's Pathological Anatomy* (London, 1849-1854).

After having given an historical survey of the development of pathological anatomy—in which he specially mentions HARVEY, WILLIS and William HUNTER—ROKITANSKY says in his introduction "Matthew BAILLIE'S anatomy of morbid structures (translated into German by Soemmering in 1794) is distinguished by greater depth of research into the fabric of organs, and both by its generalizing tendency and its physiological

character In England many have, up to our own day, worked in Laennec's spirit Amongst these we may mention the names of ABERNETHY, Charles BELL, Astley COOPER, HODGSON, FARR, WARDROP, HOWSHIP, BARON, HODGKIN, HOPE . 'Since the time of HARVEY, the discoverer of circulation, who, in denominating our particular science 'medical anatomy,' showed how fully he comprehended its import, numerous physicians have worked out sundry branches of pathology anatomically

It was reserved for Germany, at the present day, to establish a pathological anatomy and method of working it out partly independent, partly framed according to the best models of France "

The translators' introductions to vols 1, II, and III of the handbook are of great interest SWAINE'S introduction reads as follows "The Editor has felt the necessity of abridging somewhat the author's general introduction, partly because, totally unlike the general tendency of the work, it is of too 'transcendental' a character either to suit the English language or to harmonize with English ideas, but more particularly because it is interwoven with a train of speculative reasoning upon the relation between power and matter, which might in this country very possibly give rise to misinterpretations and rebuke "

In SIEVEKING'S Preface to vol II we find the following "The principal hospital of the Austrian capital, the largest in the world, offers very extensive opportunities and unusual facilities for the cultivation of Pathological Anatomy

For a series of years the Professorship of Pathological Anatomy has been held by Dr Carl ROKITANSKY, and the numbers of medical men of all nations who are attracted to Vienna by him are the best evidence of the manner in which he has availed himself of the opportunities at his disposal All who have been fortunate enough to attend the Professor's demonstrations will be able to award him the praise of untiring industry, of acute judgment, and candid research ROKIT-

ANSKY has embodied the facts and the conclusions deduced from them in his *Handbuch der Pathologischen Anatomie*, published in Vienna during the years 1841-1846

The fact of the work having been selected for translation by the Council of the Sydenham Society is in itself a proof that it is deserving of the high estimation in which it has been held by all pathologists acquainted with continental literature I may venture to assert that no one will read his descriptions of post-mortem appearances without feeling convinced that they are drawings from Nature "

In the Preface to the third volume, MOORE writes "A knowledge of the value of Professor ROKITANSKY'S personal instructions increase my estimation of the honour of being called to translate and edit a portion of his writings The observation that ROKITANSKY has not availed himself of the writings of all British pathologists may not be without some truth His work is, however, abundantly original, and cannot fail of being yet more highly estimated in this country the more it is known Were there no other proof of this it might be found in the needless labour still incurred by some English pathologists to arrive at facts and opinions which have been already ascertained and already weighed by ROKITANSKY From his work, as from a fresh starting-point, such labourers may advance to new discoveries, without the risk of having priority claimed by a foreign observer "

ROKITANSKY was well known to the young LISTER, and in Sir Rickman GODLEE'S biography of Lord LISTER we find an interesting account of their meeting In the course of his honeymoon on the Continent in 1856, LISTER visited the most famous of the medical schools, and in one of her letters his wife refers to their stay at Vienna "At Vienna he paid much attention to ophthalmic surgery, in which he was evidently greatly interested at that time The medical school at Vienna was the largest and

most important he had yet seen. It provided much of general interest, and best of all as yet, Professor ROKITANSKY, the most eminent pathologist in the world, spent three hours and a quarter the other day in going over his wonderfully rich museum of preparations of diseases to me and some other visitors." "He not only devoted several hours to showing Joseph his museum (the finest of the kind in Europe), but also insisted that we should both spend an evening with him, which accordingly we did, and enjoyed it very much."

In 1853 SKODA'S classic work appeared in London under the title *A Treatise on Auscultation and Percussion, translated from the fourth edition by W. O. Markham*.

Wholly in the spirit of SKODA, and according to his methods, were the works of the Viennese physician ZEHETMAYER, *Grundzuege der Percussion und Auscultation, etc* (Vienna, 1843) and *Die Herzkrankheiten* (Vienna, 1845).

Herbert DAVIES, who received his medical education in Paris and Vienna, was one of the first to introduce the stethoscope into England. In the foreword to his *Lectures on the Physical Diagnosis of the Diseases of the Lungs and Heart* (London, 1851, 1854), he writes that he had wished "to direct the attention of his medical brethren to the labours of the distinguished school of Vienna, of which Professor Skoda is the acknowledged head and founder." In the same work both ROKITANSKY and ZEHETMAYER are also quoted.

When FORBES published his translation of LAENNEC'S work he was far from confident that the stethoscope "will ever come into general use." However, his doubts proved needless, for in Great Britain, English, Scottish and Irish physicians soon made use of physical diagnosis and independently developed the new method under the leadership of such men as WILLIAMS in London and STOKES in Dublin, and inspired by FORBES, GRAVES, WALSH and others. In the decades following the publication in Eng-

lish of LAENNEC'S work, we find in English medical literature a considerable number of monographs on the physical diagnosis of lung and heart diseases and an imposing series of works which deal intensively with the new methods of investigation by means of percussion and auscultation To these belong, amongst others

- STOKES *Introduction to the use of the stethoscope* (1824)
 SCUDAMORE *Observations on M Laennec's method of forming a diagnosis of the diseases of the chest by means of the stethoscope, percussion, etc* (1826)
 WILLIAMS *A rational exposition of the physical signs of the diseases of the lungs and pleura* (1828)
 SPITTAL *A treatise on auscultation in diseases of the chest* (1830)
 HOPE *A treatise of diseases of the heart and great vessels, etc* (1832)
 TOWNSEND *Tabular view of the principal signs furnished by auscultation and percussion* (1832)
 BRYAN *The sounds of the heart* (1833)
 COWAN *A bedside manual of physical diagnosis* (1836)
 STOKES *A treatise on the diagnosis and treatment of the diseases of the chest* (1837)
 ELLIOTSON *On the recent improvements in the art of distinguishing the various diseases of the heart* (1838)
 BENNETT *On the art of percussion as applied to the diagnosis of thoracic and abdominal diseases* (1842)
 WALSH *Physical diagnosis of diseases of the lungs* (1843)
 STOKES *A treatise on diseases of the heart and aorta* (1853)
 HUGHES *Clinical introduction to the practice of auscultation, etc* (2nd ed 1854)
 COTTON *Clinical lectures on the physical diagnosis of phthisis* (1862)

Of the progress in physical diagnosis for which we are indebted to British physicians we may mention the following

The *finger percussion*, which took the place of Auenbrugger's method of percussion with the whole hand, was used by English physicians and particularly recommended by William STOKES

The first physician to investigate the *acoustic basis of the sound phenomena* was Ch J B WILLIAMS As the result of his teachings, in 1835 the so-called Dublin

Committee was formed for the purpose of investigating the cause of the sounds of the heart, basing its examination upon experiments made by WILLIAMS in connection with HOPE, JOHNSTON and MALTON. Its conclusions were followed in most respects by the so-called London Committee of August 1835. The latter consisted of WILLIAMS, TODD and CLENDINNING. In the *Dublin Hospital Reports* of 1830 EVORY KENNEDY described the sounds of the umbilical cord. As early as 1827 Thomas HODGKIN described in the *Medical Gazette* the "retroversion" of the aortic valves, as later did CORRIGAN, who also pointed out the diastolic *Brut de scie*. William HENDERSON (*Edinburgh Medical and Surgical Journal*, 1837) drew attention to the delay of the peripheral pulse in relation to the heart-beat. Very early on, James JOHNSON identified the heart diseases which are complications of articular rheumatism. The recognition of embolism and endocarditis lies to the credit of William SENHOUSE KIRKES. The accentuation of the second sound over the pulmonary artery in mitral incompetence was pointed out by HOPE and emphasized by SKODA (1839).

In his chief work Skoda has opposed some opinions of WILLIAMS, STOKES, HOPE and CORRIGAN.

CHAPTER VI

THE THERAPEUTIC SCEPTICISM OF SKODA

THE high standard which was reached in physical diagnosis enabled SKODA to follow the course of diseases independently of the subjective symptoms, and he used this touchstone as far as possible in order to throw light on the value of the methods of treatment used by his contemporaries. The worthlessness of many therapeutic measures in common use was thereby revealed, and so SKODA gradually reduced them to a minimum.

While it cannot be denied that SKODA's clinic became a centre from which were disseminated profound doubts of the value of current methods of healing—a true *therapeutic scepticism*—it must be emphasized that it was not the master himself, but a number of his pupils and followers (particularly DIETL and HAMERNIK) who in work and writing prematurely formulated the viewpoint known as *Therapeutic Nihilism*.

These men wrongly identified the methods of the physician with scientific investigation, and completely ignored the human and psychological aspects of his profession. Moreover, led astray by anatomical ontologies, they neglected and even ignored the physiological conception, and the hygienic and dietetic influence upon the organism as a whole. These words of DIETL serve as an example of this school of thought: "By the sum of his knowledge must the physician be judged, in the physician we should prize the naturalist, not the empiric and his success. As long as there are lucky physicians, so long are there no scientific physicians. . . . but the patient will avoid the scientific physician. Of course *the scientific physician attaches no weight to treatment*, in science alone he seeks his power. *Nature alone can cure*."

ZEHETMAYER expressed himself similarly, and HAMERNIK was even more radical. SKODA'S pupil HEBRA, who was later so celebrated, attached to his doctoral dissertation (Vienna, 1841) the thesis "*Ut plurimum naturae vi medicatrice, non medicaminibus morborum sanitatis adscribenda*"

The unprejudiced observation of the course of diseases based on pathological anatomical knowledge had confirmed the conviction held in the Vienna Medical School that the natural healing process was of the greatest importance. The courage to practise the expectant or symptomatic and expectant therapy based on this conviction was encouraged by witnessing the successes of Homœopathy, a method which appears to lack any serious foundation. The success of Animal Magnetism, and particularly the cures of the Silesian peasant PRIESSNITZ, the apostle of the water-cure, pushed ordinary medicinal therapeutics further into the background, and helped to centre attention upon the "healing power of Nature". Towards the middle of the nineteenth century, following the enthusiastic work of PRIESSNITZ, the water-treatment was often heralded as a cure-all for many affections. PRIESSNITZ, who lived in Graefenberg in Austrian Silesia, saw his fame spread far and wide. His treatise was translated from German into various languages (the English translation, *The Cold Water Cure, its Principles, Theory and Practice*, was published in London in 1842), and many physicians followed his method of treatment to varying degrees.

In the main, faith in the healing power of the available drugs disappeared with the sight of the lesions in the final stages of disease, as revealed by the post-mortem.

On the other hand, because pathological anatomy showed the possibility of spontaneous healing in certain circumstances, it seemed best for medical action to confine itself to providing the most favourable conditions for the undisturbed course of the natural healing process,

or to assisting the vital indications by active measures, if necessary

John FORBES paid particular attention to the problem of the healing power of nature. He had already dealt with this theme in his treatise, *On Homoeopathy, Allopathy and young Physic* (*British and Foreign Medical Review*, 1845), in the course of a review of various therapeutic methods. In the advertisement of Forbes's work, *Of Nature and Art in the Cure of Disease* (London, 1857), we read "The manuscript from which this small volume is extracted has lain by me for several years, and is still incomplete. The present portion of it is now published separately, because I believe it will be useful even in its actual fragmentary form, and because advancing years leave me but slight hopes of being able to finish the work according to the original plan. It is thought that the general views here given will enable such junior practitioners as may study them, to apply them, of their own accord, to the improvement of their treatment of diseases, by strengthening their confidence in Nature's powers, and by mitigating in their hands, the evil of Polypharmacy, and of that meddlesome and perturbative practice still as predominant in this country."

Homoeopathy plays no small part in the argument, which gives evidence of his great wisdom and critical faculty. In it FORBES tries to show that homoeopathic practice ("now so widely spread") may be regarded as the greatest experiment yet undertaken to prove the existence of the healing power of nature. "A celebrated professor, on being told that a new sect—the Homoeopaths—had sprung up, which cured diseases by infinitesimal doses of medicine, replied that he himself had long before been in the habit of doing more than this, viz curing diseases by none."

FORBES also pointed out that homoeopathy had unwittingly contributed much to the improvement of therapeutics. "I cannot help remarking, that though in

itself one of the greatest and most singular delusions that has ever been entertained by the professors of the healing art—and this is saying a great deal—the lessons derived from it have been of vast benefit to the professors of our rational system of medicine. The favourable practical results obtained by the homœopathists—or, to speak more accurately, the wonderful powers possessed by the natural restorative agencies of the living body, demonstrated under their imaginary treatment—have led to several other practical results of value to the practitioners of ordinary medicine. Besides leading their minds to the most important of all medical studies, that of the natural history of diseases, it has tended directly to improve their practice by augmenting their confidence in Nature's powers, and proportionally diminishing their belief in the universal necessity of Art, thus checking that unnecessary interference with the natural processes by the employment of heroic means, always so prevalent and so injurious. It has thus been the means of lessening, in a considerable degree, the monstrous polypharmacy which has always been the disgrace of our art—by at once diminishing the frequency of administration of drugs and lessening their dose."

In spite, however, of his criticism of active healing methods—with the exception of surgery, the curative results of which he did not doubt—FORBES is far from falling into the radicalism advocated by many followers of the Vienna School. On the contrary, he devotes five chapters of his book to a discussion of the methods and problems, the ends, means and achievements of medical practice. "We shall see, in the remaining chapters of this work, which treat of the Medical Art, that the statement just made is far from being tantamount to saying that this art is powerless and useless. It will be there shown that the Medical Art has a noble and most beneficial part to play, in its true character of a handmaid and helper of Nature, although it may seem shorn of some of

the heroic attributes with which ignorance and early superstition may have falsely decked it "

FORBES discusses thoroughly the methods at the disposal of the practitioner, particularly for the purpose of a symptomatic, direct or indirect therapy. Regimen, physical means and pharmaceutical means are considered as the main groups. His emphasis upon the importance of prophylaxis by measures of public and private hygiene is quite in the spirit of modern ideas. "If the future more precise experience of enlightened physicians, and the sure advance of medical science must tend, as it is believed they will tend, to lessen considerably the confidence in the powers of medicinal therapeutics at present entertained by medical men, it cannot be doubted but that an ample compensation, both to medicine and humanity will be found in the proportionate development of the hygienic or preventive department of the art "

FORBES'S first treatise, edited by A. D. BAUER, was published in Vienna in 1846 with the title *Homoöpathie, Allopathie und die neue Schule*.

The crucial experiment for pure expectant therapy was made in the field of inflammation of the lungs, for this was an affection for which *venesection* was at that time thought to be absolutely necessary. The results of many investigations which compared the mortality in the course of pneumonia when venesection was used and when it was not used led the Vienna school to reject this most sovereign method of contemporary medicine. In connection with a discussion in the *Gesellschaft der Ärzte zu Wien*, DIETL published a work which is particularly significant in the history of the "Therapeutic revolution." This was *Der Aderlass in der Lungenentzündung* (Vienna, 1848). While the importance of venesection as a symptomatic method of healing could not be entirely denied in certain cases, DIETL'S very wide experience as the chief of a great hospital department induced him to recom-

mend expectant therapeutics as the only truly scientific method

In Britain, the excessive use of venesection in inflammation of the lungs and other inflammatory affections was later successfully opposed, especially by John Hughes BENNETT in Edinburgh. His obituary notice in the *Lancet* says "he demonstrated not only the dispensableness, but the injuriousness of the 'antiphlogistic' treatment which has ruled the best minds of the civilized world for ages. Doubtless other physicians were working in the same direction even before Bennett. But he devised a treatment of his own which has given most brilliant results, and he adhered to it, and to the pathological views on which it was based, so steadily, and for so long a series of years as to establish its truth, and so largely revolutionize the practice of medicine in acute diseases." Of his numerous works, we must consider his *Observations on the Results of an Advanced Diagnosis and Pathology Applied to the Management of Internal Inflammation compared with the Effects of a former Antiphlogistic Treatment, and especially of Blood-letting* (1857) and *The Restorative Treatment of Pneumonia* (1865).

Also R. B. Todd, the outstanding physiologist, neurologist and clinical teacher at King's College Hospital, held strong views on the treatment of acute diseases and applied in practice his belief that "antiphlogistic" treatment was unnecessary for the cure of certain acute diseases, i.e. inflammation and fever. Such conditions had been previously treated by bleeding and the use of calomel, antimony and lowering remedies generally. Todd's views are embodied in the following propositions: (1) That the notion, so long prevalent in the schools, that acute disease can be prevented or cured by means which depress and reduce vital and nervous power, is altogether fallacious. (2) That acute disease is not curable by the direct influence of any form of drug or any known remedial agent, except when it is capable of acting as an

antidote or neutralizing a poison on the presence of which in the system the disease may depend (3) That the disease is cured by natural processes, to promote which, in their full vigour, vital power must be upheld Remedies, whether in the shape of drugs which exercise a special physiological influence on the system, or in whatever form, are useful only so far as they may excite, assist or promote these natural curative processes (4) That it should be the aim of the physician (after he had sedulously studied the clinical history of the disease and made himself master of its diagnosis) to enquire minutely into the ultimate nature of these curative processes—their physiology, so to speak—to discover the best means of assisting them, to search for antidotes to morbid poisons, and to ascertain the best and most convenient means of upholding vital power Todd's views were embodied in the last volume of his *Clinical Lectures*, published in 1860 He taught that the vital powers of the patient should be upheld by the administration of brandy, which he prescribed in "low diseases" in doses as much as one or even two ounces every hour over a short period Mild cases of fever and inflammation were treated by him without stimulants, or at any rate, in but moderate quantities

The reproach of "therapeutic nihilism" is less easily levelled against the Vienna school after 1853, in which year the circle was joined by Joh von OPPOLZER, the evangelist of physiological healing In spite of his acknowledged diagnostic mastery, and although he adhered to anatomical ideas, he proclaimed healing as the highest aim of medical science, and knew how to hold the balance between doctrinaire polypragmatism and therapeutic scepticism The final result was that later expectant symptomatic therapeutics gained scientific recognition, in the absence of an aetiological therapy directly aimed at the cause of the illness

In spite of the incredulity which prevailed in the Vienna

medical school with respect to the treatment of disease by drugs, there yet sprang from its fold a famous pharmacologist, C D SCHROFF. He made scientific tours to the chief countries of Europe, and in 1839 in Vienna was appointed to a chair of pharmacology and a pharmacological laboratory. He tested numerous drugs, particularly alkaloids, and he investigated experimentally the action of drugs, or their most active constituents, upon animals as well as upon healthy men. He was also the first to discover, through investigations on *Coca* leaves, their anaesthetic action.

THE ANATOMIST HYRTL SPECIALLY CHOSE
BRITISH MASTERPIECES AS EXAMPLES

A STAR of the first magnitude of the second Vienna School was Joseph HYRTL, from 1845 Professor of Anatomy in Vienna, who combined a most extensive knowledge with technical ability, and a still rarer gift of exposition. His main achievements lie in the fields of the comparative anatomy of the ear, of injection technique, and of the history of anatomy. Besides an unusually large number of special works he published a *Lehrbuch der Anatomie des Menschen, mit Ruecksicht auf physiologische Begrueudung und praktische Anwendung*, which appeared in twenty editions, and dominated its special field throughout the second half of the nineteenth century. He also published a *Handbuch der topographischen Anatomie und ihrer praktisch medicin-chirurgischen Anwendung*.

Austria and Germany have HYRTL to thank for the introduction of topographical anatomy. The museums which he directed, as well as others, have to thank his indefatigable activities for their enrichment, particularly with whole series of specimens of comparative anatomy.

His *Handbuch der praktischen Zeigliederungskunst* is an excellent guide to the use of sections and the making of anatomical preparations.

In these three chief works he chooses especially the British masterpieces as examples. In his historical introduction to the *Lehrbuch* he gives particular praise to John and William HUNTER, and speaks with the greatest respect of the results of English investigators in the field of comparative anatomy. He points out that in England

anatomy was hardly ever separated from its practical use, and that this tendency was chiefly maintained by BAILLIE, Everard HOME, ABERNETHY, John and Charles BELL, Astley COOPER, etc

HYRTL made ample use of his wide and fundamental knowledge of British literature, and cites among others BARCAY, John BELL, BOWMAN, BRODIE, BURNS, CHESELDEN, COOPER, CURLING, ELLIOTSON, HARRISON, HUNTER, LAWRENCE, LITTLE, LIZARD, MACLEOD, MONTGOMERY, PRICHARD, QUAIN, STEVENS, TODD, TRAVERS, TURNER, WHITE, R WILDE, and WILSON.

Among the journals he quotes are *Medico-Chirurgical Transactions*, *London Medical Gazette*, *British and Foreign Medico-Chirurgical Review*, *Edinburgh Medical and Surgical Journal*, *Dublin Hospital Reports*, *Natural History Review*, *Journal of Anatomy*, *Memoirs of the Medical Society of London*, *Transactions of the Royal Irish Academy*, *Lancet*, *British Medical Journal*, etc

HYRTL's extraordinarily popular *Handbuch der praktischen Zerghliederungskunst* had English notes for the practice of dissection and for the method of making preparations, e.g. John SHAW's *Manual for the Student of Anatomy*, etc (London, 1821), F KNOX, *The Anatomist's Instructor and Museum Companion* (Edinburgh, 1830), *The Edinburgh Dissector* (London, 1837), *The Dublin Dissector*, etc, by R HARRISON (6th ed, Dublin, 1838). As compendiums of comparative anatomy he recommends in the first edition of his *Handbuch*, RYMER-JONES, *General Outlines of Comparative Anatomy*, R E GRANT's *Outlines of Comparative Anatomy*, and EVERS, *The Student's Compendium of Comparative Anatomy*. HYRTL was a man of encyclopedic learning as well as a polyglot. His anatomical works are enlivened by notes on general history as well as on the history of culture and medicine, quotations from the classics, etc. His brother Jacob HYRTL lived in London and was a painter and engraver.

Hyrtl's successor, C Langer, as Rector of the University, delivered a lecture on Thoms Willis

ROKITANSKY, whom VIRCHOW later designated as the *Linnaeus* of Pathological Anatomy, had realized that this highly important foundation of pathology must be supplemented by histology, bio-chemistry and animal experiment in order to arrive at a complete understanding of the various processes of disease

The first in Vienna to make Microscopical Anatomy the special object of his research was PROCHASKA's protégé BERRES, who was HYRTL'S predecessor as Professor of Anatomy, and whose excellent work, *Anatomie der mikroskopischen Gebilde des menschlichen Körpers*, appeared during the years 1836-1843. ROKITANSKY used the microscope in the service of pathology in the course of his subsequent researches and encouraged many of his best pupils also to use it. One of the oldest of these was GRUBY, later an important dermatologist in Paris, who published in Vienna in 1839 his *Observationes microscopicae ad morphologiam pathologicam spectantes*

At about the same time normal and pathological histology found its pioneer and distinguished representative in the Edinburgh physiologist and pathologist, John Hughes BENNETT. He was the first in Great Britain to give systematic lectures on this subject, together with demonstrations and practical exercises. Great credit is due to him for his clear recognition of the importance of the microscope in the clinical investigation of diseases.

In Vienna Carl WEDL, who was inspired by ROKITANSKY, and who had visited France and England for the purpose of scientific studies, was at first lecturer, and after 1853 extraordinary professor of pathological histology, and devoted himself entirely to this study. His great work, *Grundzüge der pathologischen Histologie* (Vienna, 1854), received widespread recognition, went through several editions and was translated into Dutch and English. The English translation was made by George RUSK

and published in 1855 by the Sydenham Society with the title, *Rudiments of Pathological Histology*. In the preface it is stated that "At present the chief value of any work on the subject will consist in the amount of original information in the shape of facts which it may contain, and in this respect, credit is eminently due to Dr Wedl's labour. The extent of original information and of original illustration in his work will always entitle it to a high place."

As regards biochemistry, there had been important progress in Britain since the last decades of the eighteenth century (CRUIKSHANK, ROLLO). W. CH. WELLS gave the credit of discovery of albumen to Cruikshank, who mentioned it in 1798, but points out that he had discovered it independently in dropsy (in 1799). Wells differentiated (in 1811) the forms of dropsy in which albumen is found and even indicated that the kidneys were diseased, but he failed to point out the causal relationship between the two. A. T. MARCET published in 1817 an *Essay on the Chemical History and Medical Treatment of Calculus Disease*. William PROUT brought to the aid of practical medicine a sound and comprehensive knowledge of animal chemistry. The first results of his researches appeared in 1821, when he published his book, *An Enquiry into the Nature and Treatment of Gravel, Calculus and other Diseases of the Urinary Organ*. In later editions of the work, Prout still further elaborated his views, and included the subject of digestion. Many fundamental truths concerning metabolism were first stated by him, among which may be mentioned the facts that urea was formed in the blood, and was merely excreted by the kidneys, that the healthy stomach contained always a percentage of hydrochloric acid.

In Vienna, apart from a slight stimulus given to the study of biochemistry by Joh. Peter Frank, it remained without a following until the forties of the nineteenth century, and even then full recognition was not forth-

coming It must be mentioned here that about this time there appeared in Vienna a *Handbibliothek des Auslandes für die organisch-chemische Theorie der Heilkunde* by ECKSTEIN, in collaboration with several other physicians Volume I contained a German translation of Golding BIRD'S *Lectures on the Physical and Pathological Characters of Urinary Deposits, delivered at Guy's Hospital* (London, 1843), and Volume II, S WRIGHT'S *On the Physiology and Pathology of the Saliva* (London, 1842-44)

Because of his training in the laboratories of LIEBIG and WOHLER, Johann Florian HELLER was entrusted with the chemical investigation of pathological secretions and excretions at the Vienna Allgemeine Krankenhaus HELLER became a very active worker in the field of physiological and pathological chemistry, and founded the *Archiv für physiologische und pathologische Chemie und Mikroskopie* (1844-47, 1852-54) In this journal are recorded his researches into the urinary pigments and the proof of the occurrence of albumen and glucose in the urine A number of reactions which are still employed in the clinical examination of urine still bear the names which HELLER first applied to them He also advanced considerably our knowledge of urinary concretions Unfortunately the contemporary leaders of medical teaching in Austria did not value his achievements as they deserved

From 1850 onwards the study of physiological chemistry and microscopic anatomy was further advanced by the numerous excellent papers of the great and versatile investigator Ernst von BRUCKE published during his forty years of teaching as professor of physiology in Vienna (1849-89) His slightly older contemporary, Sir W BOWMAN, who in 1838, while professor at King's College, visited the hospitals of Holland, Vienna and Paris, combined in a remarkable manner anatomical and physiological research with his surgical activities After 1855 he devoted himself almost exclusively to ophthalmology with the greatest success Between the years 1839 and

1842 came his outstanding investigations on the structure of striped muscles, of the mucous membranes of the alimentary canal, and of the kidneys. The term *Bowman's capsules* recalls his most important work. He also formulated a singular theory of urinary secretion in his work, *On the Structure and Use of the Malpighian Bodies of the Kidney with Observations on the Circulation through that Gland* (*Philosophical Transactions*, 1842). In collaboration with Bentley TODD he edited the important work, *Physiological Anatomy and Physiology of Man* (1845-56).

Frequently BOWMAN'S and BRUCKE'S epoch-making investigations converge, as in their views on the structure of the striped muscle and particularly on the microscopic anatomy of the eye. *Lectures on the Parts Concerned in the Operations of the Eye* (1849). In this work BOWMAN opposed the structure in layers of the vitreous humour as described by BRUCKE in 1843. In his paper, *On Some Points in the Anatomy of the Eye, chiefly in reference to the Power of Adjustment* (1847), BOWMAN demonstrated simultaneously with, but independently, of BRUCKE, the structure and function of the *ciliary muscle*. It was ROB KNOX who discovered, in 1822, the essentially muscular nature of the structure which was called the ciliary membrane but which, with the simple magnifying instruments of those days, he proved to be truly muscular. But later the merit of the discovery was credited to BOWMAN and v. BRUCKE.

Experimental pathology as a separate subject of study was the creation of ROKITANSKY. Through his efforts a special institute was founded for this field of research, and its directorship entrusted to S. STRICKER. STRICKER came from BRUCKE'S school, where he had become assistant owing to his excellent histological and embryological work. One of his discoveries had to do with the diapedesis of the red blood cells. In 1866 STRICKER was placed in charge of experimental research in OPPOLZER'S clinic, and in 1868 he was appointed professor of experimental

pathology His *Handbuch der Lehre von den Geweben des Menschen und der Thiere*, written in collaboration with other histologists, was published in an English translation by H. POWER by the Sydenham New Society, with the title *Manual of Human and Comparative Histology* (3 vols., London, 1870-73). STRICKER was outstanding as an experimental investigator and histologist and was the first to use in his teaching the projector for experimental and microscopic demonstrations. Besides his numerous specialized works he engaged in philosophical studies, continuing in the path laid down by BERKELEY, HUME, JOHN LOCKE and other British thinkers (THOMAS BROWN, JAMES MILL, ALEX. BAIN). STRICKER contributed studies on the structure and proliferation of cells, the anatomy of the cornea, the capillary circulation. He discovered the contractility of the capillary tubes, observing that the capillaries became constricted by swelling of the endothelial cells (1865). Yet THOMAS YOUNG had in 1808 the foresight to assume as probable variation in the size of capillaries.

CHAPTER VIII

HEBRA FOLLOWED CLOSELY THE ENGLISH WRITERS ON DISEASES OF THE SKIN

THE reform of *Dermatology* was due to improved methods of research in pathological anatomy and clinical medicine. Dermatology had been studied with profit in England and France, but in Vienna it was completely neglected until the forties of the nineteenth century. To Ferdinand HEBRA, however, we owe particularly the credit for linking dermatology to pathological anatomy. His very active career was from beginning to end strongly influenced by his famous teachers Rokitsky and Skoda.

Already in 1841 the annual report of the department for chronic skin diseases in the Allgemeines Krankenhaus showed Hebra's unusual ability in the sphere of dermatological diagnosis, in which he followed closely the English, whom he esteemed highly for their practical insight. His treatise, "Über die Krätze," published in the *Medicinisches Jahrbuch* (1844) formed the actual starting point for a new conception of dermatology. In this paper he pointed out for the first time and proved conclusively the purely local nature and purely local cause of the skin disease *Scabies*, and showed too that only local therapeutic measures could effect a cure. He also showed by experiments with irritants that, as with scratching in the case of scabies, so also with traumatic and chemical irritations, artificial inflammation of the skin is produced in the form of redness, swelling, blisters, blotches, pimples, etc. While HEBRA was applying the clinical methods of SKODA to other skin diseases, he succeeded in establishing the typical course of the diseases on the basis of the pathologic-anatomical changes. As early as 1845 he was able to publish a new classification of skin diseases. His



FERDINAND HEBRA
1816-1880

system comprised twelve classes of certain basic diseases, distinguished by typical pathologic-anatomical differences. HEBRA had held courses which were well attended since 1842, and patients flocked to him from all parts of Austria, so that by 1845 he had seen no less than 10,000 cases of skin disease. He became first physician in 1848, extraordinary Professor in 1849, and ordinary Professor in 1869. As a clinician the wealth of his experience was second to none, and he was a distinguished teacher. His work for reform consisted chiefly in discrediting the humoral pathological theories, and in proving that most dermatological conditions were specific diseases of the skin itself, although he did not deny the connection of many skin diseases with internal changes. Consequently, he placed local and external curative applications above all other methods, but he did not neglect internal medication in cases where a connection with internal disease was acknowledged. HEBRA'S *Lehrbuch der Hautkrankheiten* (1860), the second edition of which (1876) was edited in collaboration with KAPOSÍ, attained world-wide fame. His *Atlas of Skin-diseases*, with its wonderful illustrations by ELFINGER and HEITZMANN, is also of lasting value.

In 1852 HEBRA came to London and Paris in the course of a journey made for the purpose of studying leprosy, which had led him first to Norway. His celebrated textbook was produced in an English translation by the New Sydenham Society. In the preface to this edition of his work, *On Diseases of the Skin including the Exanthemata*, translated and edited by C. Hilton Fagge (New Sydenham Society, London, 1866), he said "It was with great pleasure that I acceded to the request of the Council of the New Sydenham Society that I would allow my work on diseases of the skin to be translated into the English language. Of the compliment paid to me by the Society in making this request I am more sensible, because English literature is by no means poor in treatises

upon cutaneous affections. Thus, although during the last century this branch of medical science was cultivated with zeal both in Germany and France, *it was England, the country of Willan and Bateman, which took the largest share in what may be termed the Reformation of Dermatology*. In fact, not only later English writers on diseases of the skin, but also those of every other country, have made use of the Classification of WILLAN in arranging the subdivision of their own system, or, indeed, have even adopted this classification without modification. Within the last few years, in particular, several English physicians have pursued the study of cutaneous affections, and have succeeded in adding very considerably to the general fund of knowledge in this department of medicine. Among these I must mention especially my talented friend Mr ERASMUS WILSON, as well as Dr Anthony Todd THOMSON and Dr T McCall ANDERSON. The works of these writers, whether systematic treatises, or monographs upon general dermatology or upon particular diseases of the skin, have rendered them famous throughout the Continent as well as in their own country. I might name many others who have won for themselves a deserved reputation, either by excellent articles in the medical journals (HUTCHINSON, ADDISON, GULL) or by the success with which they have devoted themselves to the treatment of cutaneous affections (STARTIN, HILLIER, TILBURY-FOX) ”

Finally, we must not forget to mention that HEBRA was responsible for the introduction into the Vienna Clinic of permanent water-beds for patients as a cure for burns (1861). It is known that it was the genial Scottish physician Neil ARNOTT who in 1832 devised the hydrostatic or water-bed for burns.

Contemporary with HEBRA was C Sigmund VON ILANOR, the most famous syphilographer of the Vienna School. He won a reputation as one of the first champions of international hygiene (in plague, cholera, etc.), and like

RICORD, showed himself to be a sprightly writer on bathing resorts in his book of travels. In London, in 1854, was published DUMBROCK'S *Report on the Medical Topography and Diseases of the Turco-Danubian Provinces*

Among Hebra's pupils were his successor as Professor of Dermatology, M Kaposi, N Auspitz, and the syphilographer Hermann v Zeissl and I Neumann. Zeissl's chief work has been translated into English, *Outlines of the Pathology and Treatment of Syphilis and allied Venereal Diseases*. Translated with notes, C H Raphael (1886)

Among the best of the collaborators of Rokitansky and Skoda was the distinguished Viennese surgeon, Franz SCHUH, who used the results of pathologic-anatomical and microscopical investigations as well as physical diagnosis in the surgical clinics. SCHUH was the first to perform a puncture of the pericardium (1840) and among his important works are *Ueber den Einfluss der Percussion und Auscultation auf die chirurgische Praxis*, *Erfahrungen über die Paracentese der Brust und des Herzbeutels*, *Pathologie und Therapie der Pseudoplasmen*, and *Über Gesichtsnervengelen und über Erfolge der dagegen vorgenommenen Nervenresectionen*. He was a brilliant operator and an excellent teacher, and from 1842 he was director of the newly-created Second Surgical Clinic in the Allgemeines Krankenhaus, being the predecessor of BILLROTH in this post. SCHUH was the first German surgeon to anaesthetize a patient with ether, in 1847. The news of the "ether process for removing pain" had spread rapidly from Boston. A private letter from Dr T Bigelow to Dr Francis Boote in London carried the first news to England, and was communicated to the medical profession on December 17, 1846. Two days later, Mr James Robinson, a dentist of Gower Street, performed the first dental operation under ether in England. On December 21st the first surgical operation under the new anaesthetic in England was performed by Robert LISTON in University College Hospital, London.

CHAPTER IX

THE DISCOVERY OF THE AETIOLOGY OF CHILDBED FEVER BY SEMMELWEIS

At the time when the new Viennese medical school stood at its climax the clinic, which was utilized for the instruction of medical students in obstetrics, was in a deplorable state. The mortality from puerperal fever was enormous, and a remarkable feature of the case was that the second clinic, where midwives were trained, showed a considerably lower percentage mortality than that for training medical students. The authorities, regarding puerperal fever as a peculiar form of epidemic disease, blamed all sorts of atmospheric, cosmic and telluric influences, said that perhaps overcrowding was a fault, etc. Ignaz Philipp SEMMELWEIS, who became assistant at the clinic in 1846, was not satisfied with the usual explanation and occupied himself untiringly with discovering the true cause. Finally, he came to the conclusion that this terrible disease was due mainly to the transference of poison from corpses, brought in by doctors and students who had been busy in the dissection room before the examination of the pregnant woman. There were two things that forced him to this conclusion. First the fact that the puerperal mortality was so different in the two clinics. In the years 1841-46 it amounted to 10 per cent in the clinic visited by medical students only, in contrast to 3.38 per cent in the clinic used only by midwives. Secondly, the Viennese Professor of Forensic Anatomy, KOLLETSCKA, had died of a wound acquired during dissection. The course of his illness showed the same picture as that of puerperal fever, the findings at the post-mortem examination were the same as the post-mortem findings from women who had been delivered and who had died of puerperal fever—



IGNAZ PHILIPP SEMMELWEIS
1818-1865

namely pyaemia SEMMELWEIS therefore gave an order, in the second half of May 1847, that everyone who was about to undertake an obstetrical exploration with the hand should first wash in chlorinated water (1 oz of calcium chloride to $1\frac{3}{4}$ pints of water) Within a short time the mortality rate fell from 9.92 per cent to 3.8 per cent Following general adoption of this procedure, the mortality in the clinic dropped still lower, for example, to 1.27 per cent in the year 1848, although the number of births had increased In addition to the year 1847, SEMMELWEIS established that not only the poison from corpses, but every decayed organic material could bring about puerperal fever by transference Consequently, he extended his demands so that not only the hands of those touching patients, but also the instruments and bandages had to be disinfected beforehand in all circumstances, and the sick women had to be separated from the healthy

The first publication of SEMMELWEIS'S views occurred in two essays by HEBRA in the *Zeitschrift der Gesellschaft der Aerzte* (December 1847 and April 1848) HALLER, a physician in chief of the "Allgemeines Krankenhaus" also spoke of it in a lecture, and in the annual report for 1848 expressed himself favourably concerning the practical consequences of SEMMELWEIS'S doctrine The first full exposition was that of SKODA, given in a lecture delivered in the Wiener "Kaiserliche Akademie der Wissenschaften" in 1849 On May 15, 1850, SEMMELWEIS personally developed his view on the cause of puerperal fever and rejected the idea of "contagion" In a second lecture in the Wiener Gesellschaft der Aerzte on June 18, 1850, he examined and disposed of objections to his theory In the discussion which took place on July 15, 1850, when ROKITANSKY was in the chair, SEMMELWEIS'S theory was acclaimed as a great scientific success BEDNAR, physician to the Foundling-Asylum in Vienna, said in his book on *Diseases of the Newborn and Nurslings, studied from the Clinical and Anatomico-pathological Standpoints* (1850)

"The sepsis of the blood among the newborn has now become a great rarity, for which we have to thank the discovery of Dr SEMMELWEIS who found the cause and means of prevention of this murderously raging puerperal fever" Meanwhile Semmelweis had met with hostility, particularly from his chief, Professor Klein, and was even dismissed from the clinic His request to be allowed to lecture at the University of Vienna as "Privatdocent" was at first bluntly rejected, and was in the end granted only on the condition that he might demonstrate operations upon the model exclusively Semmelweis in 1851 shook the dust of Vienna off his feet and settled down in Pest There he was able to work as physician to the St Rochus Hospital and became in 1855 professor of midwifery at the University Apart from his chief work, *Die Aetologie, der Begriff und die Prophylaxe des Kindbettfiebers* (1861), he wrote "open letters" to Spaeth, Scanzoni, v Siebold and finally "to all professors of obstetrics" in which he passionately defended his doctrine

The overwhelming majority of continental obstetricians and pathologists held the preconceived opinion that a certain "genius epidemicus," i.e. a cosmic-telluric-miasmatic influence was the cause of puerperal fever, and consequently the doctrine of SEMMELWEIS was rejected *a priori* by most of them, in 1858 by the Academy of Medicine in Paris and in 1861 by the "Versammlung deutscher Naturforscher und Ärzte" at Speyer In the early years only very few obstetricians declared themselves to be followers of SEMMELWEIS Doubtless the fact that he was often thought to have regarded the disease as an infection due solely to contamination from cadavers (as in dissection and post-mortems) acted as an obstacle to the spread of his doctrine

But matters were otherwise in Great Britain and in Ireland, for there a theory prevailed which was to result in a great amelioration of the lot of the parturient This

was the *theory of contagion*. Those physicians who were "contagionists" still used the term "epidemic," but with them it signified not a state initiated by a hypothetical influence, but an unusual number of coincident cases of the disease in question. So it was explained by B. LABATT, the master of the Dublin Lying-in Hospital, that the epidemic of puerperal fever in 1818 was due to the prevalence of "typhus" fever in the city. Patients were ill on admission and so succumbed readily to puerperal fever. A great effort had been made to stamp out the disease. They had isolated the sick, changed the beds and bedding frequently, as well as the furniture and utensils, scoured with chloride of lime, fumigated with chlorine gas, and impressed upon the nurses and servants the necessity of cleanliness and ventilation. These efforts were in part successful. The mortality fell from 6 per cent to 2.5 per cent.

In 1841, STORRS of Sheffield, from observations on his own cases and from evidence collected among his friends, came to the conclusions (1) that puerperal fever may be communicated by touch, (2) that it originates in some animal poison, especially from erysipelas and its complications, and in less degree from "typhoid fever." He therefore drew up the following rules for the obstetrician: (1) to avoid treating cases of erysipelas, (2) to avoid post-mortem examinations. If either or both of these procedures are unavoidable, then the practitioner should use disinfectants and change his clothes.

These examples show that disinfectant measures against childbed fever were already used in Great Britain and in Ireland, before Semmelweis's calls of warnings. As A. H. BURGESS has proved, Charles WHITE of Manchester, may be regarded as real predecessor of Semmelweis concerning disinfectant measures against childbed fever. It was he who urged that special attention be devoted to all such matters, as good hygienic surroundings, scrupulous cleanliness both personal on the part of all attendants and

also of any material likely to come in contact with the patient, bed linen, towels, sponges, instruments, proper ventilation of the lying-in chamber, maintenance of an even moderate room-temperature and correct posture of the patient. All these advices had been given in WHITE'S *Treatise on the Management of Pregnant and Lying-in Women* in 1773. As the result of his methods he reported that of the large number of lying-in patients he had delivered, he had never lost one from puerperal fever. Successful results of White's methods were also reported by Eli Cope, Robt Collins of Dublin, and others.

Still during Semmelweis's assistancy, Dr Routh of London attended the first Obstetrical Clinic in Vienna as a student, and what he saw there convinced him. He returned to his own country, resolved to spread Semmelweis's teaching there. Routh sent letters to the discoverer, with the following contents:

Dorset Square, London, January 23, 1849

"In the assembly of English physicians which took place the last week in November, 1848, I delivered a lecture in which I announced your discovery, securing the extreme honour rightly due to you. I can say that my address was well received and that many of the most learned members declared that the arguments were convincing. Among these were, in particular, WEBSTER, COPELAND and MURPHY, all famous physicians, who spoke extremely well of you. In the November issue of the *Lancet*, all of this discussion can be read. Do you think that the cases which occurred after my departure also support your opinions? Is childbed fever less common than before? If this dangerous disease occurs less frequently in the obstetrical wards than formerly, then this most significant success is established. In Prague also, where childbed fever is so common, it is attributed to the same exciting cause."

Dorset Square, London, May 21, 1849

"My notes on your discovery have been published in a brochure ('On the cause of the endemic puerperal fever of Vienna' By C H F Routh, M D, London, 1849, Reprinted from the *Medico-Chirurgical Transactions*, Vol 32) "

Dorset Square, London, December 3, 1849

"The reputation and the truth of your discovery are ever growing in the general esteem, and all medical societies recognize and appreciate how useful it is, and this does not appear to be a rash statement for great is Truth and it shall prevail "

MURPHY, Professor of Obstetrics in Dublin, published a rather long article in the *Dublin Quarterly Journal of Medical Science*, in which he discussed the above-mentioned lecture by Routh, and agreed with the views expressed therein ("What is puerperal fever? A question proposed to the Epidemiological Society, London, by Edward William Murphy, A M, M D," Reprint 1857)

F H ARNETH, assistant in the Viennese obstetrical clinic for midwives, who was a friend of SEMMELWEIS and one of his earliest disciples, wrote in 1847 to the most famous obstetrician and gynaecologist of the time, James Young SIMPSON, in Edinburgh, and asked for his opinion SIMPSON mistook the theory of SEMMELWEIS for the English doctrine of contagion and was caustic in his reply Later, SIMPSON was made familiar with the new doctrine by Arneth in person, and his reception of it was tolerant and dignified, while at the same time he put forward his own idea of the cause of puerperal fever

We owe to ARNETH a comprehensive and unbiassed account of British and Irish obstetrics and gynaecology, which was presented in his book published in Vienna in 1853 *Ueber Geburtshilfe und Gynaekologie in Frankreich*,

Grossbritannien und Irland, grossentheils nach Reiseergebnissen

In January and February 1851 he was in London, in March in Dublin, and in May 1851 in Edinburgh. His book deals with the hospitals, the condition of the medical profession and the elementary and university education of British and Irish physicians. The obstetrical institutions, their organization and activities, and the achievements and methods of the most important specialists in London, Dublin and Edinburgh are dealt with in detail. Occasionally comparisons are made with the corresponding conditions in Vienna, and in conclusion there are comparisons of the ideas and methods of English and German obstetricians. ARNETH visited all the larger hospitals in London, and was pleased with the great cleanliness and order in all of them, and in spite of certain considerable faults, which by no means escaped his eye, he formed a favourable opinion of their merit.

"I have formed the conviction," he says, "that in these extremely spacious, quiet, well-ventilated and clean institutions, the sick feel more at home and have a more desirable stay than in many of the decorative buildings on the continent, with their noisy, overcrowded rooms, enormous smoky stoves, with their gleaming floors, but dirt everywhere behind the scenes. I at least would rather find sanctuary in the former."

In London there were three types of medical assistance for expectant mothers. First, there were the special lying-in hospitals, of which there were five at that time, secondly, women were given attention in their own homes (this service was organized either by the hospitals or by their own societies), and thirdly, there were the facilities made available in the infirmary or workhouse, where, in London at least, a special room was set aside for pregnant women. The first two types of attention were available almost exclusively for married women,

whilst the unmarried could take advantage only of the third type—the infirmary or workhouse

9 This was quite in contrast to Vienna, where about eight thousand unmarried women were cared for each year, being provided not only with attention at the time of birth, but also with after-care, whilst the children were cared for at the State's expense

ARNETH found the obstetrical instruction given to young doctors and midwives in Britain completely inadequate. The prospective practitioners often heard quite excellent theoretical lectures, but practical instruction was sadly lacking, and for this the lack of practice in a Maternity hospital was to blame. ARNETH mentions the following as the most important London obstetricians: LOCOCK, ROBERT LEE, CONQUEST, EDWARD RIGBY, TYLER SMITH, RAMSBOTHAM, WEST, OLDHAM, LEVER, MURPHY, BIRD, H. BENNET. The last named was the first in England to make extensive use of *Recamier's speculum*, by means of which the treatment of uterine disease was revolutionized.

In Dublin the great Rotunda Lying-in Hospital was the point of attraction for ARNETH, and judging it as an expert, he wrote a lengthy description of it, particularly because it was the seat of the important Dublin school of obstetrics. He compared its organization with that of the Viennese institution, in which he weighed the advantages and defects of each. In addition, he discusses the difference in the methods of the Dublin and Viennese obstetricians in certain cases (perforation, the use of forceps, the measures taken in cases of rigid(?) uterus, and of prolapse of the umbilical cord). Among the senior physicians of the institution, who held the title of "masters," SIR FIELDING OULD, JOSEPH CLARKE, COLLINS and KENNEDY exercised a lasting influence on the development of obstetrics, and SHEKELTON must also be considered one of their number. It was KENNEDY who introduced the use of the stethoscope into obstetrics.

Besides those just named, ARNETH mentions the achievements of McCLINTOCK and HARDY. There were also very many important obstetricians in Dublin who worked outside the hospital, for example, MONTGOMERY and BEATTY, who gave lectures with demonstrations, using models and preparations, and there was also Fleetwood CHURCHILL.

As for Edinburgh and Scotland, it will suffice to describe the views and achievements of the heir to the fame of HAMILTON and BURNS, James Young SIMPSON. He was, as ARNETH says, perhaps the most eminent and influential obstetrician of his time. Beginning with the use of anaesthetics, ARNETH discusses SIMPSON's methods in obstetrics and gynaecology, the instruments which he invented or improved, his investigations and his writings.

ARNETH reports on SIMPSON's first experiments with ether (commencing January 19, 1847), and with chloroform (November 4, 1847) on women in childbirth. These reports are based on accounts published in the *Edinburgh Monthly Journal* and the *Lancet*, as well as in SIMPSON's chief work *Anaesthesia or the Employment of Chloroform and Ether in Surgery, Midwifery, etc.* (1849). The Edinburgh professor of surgery gave a lively description of the first use of chloroform as an anaesthetic in his work *Surgical Experience of Chloroform*, by Professor MILLER (Edinburgh, 1848). The Edinburgh physicians PROTHEROE SMITH, RIGBY, DENHAM and MURPHY were declared supporters of the use of anaesthetics in obstetrics, whilst among other practitioners MONTGOMERY, CHURCHILL and CONQUEST gave only qualified support, and MEIGS and RAMSBOTHAM were entirely opposed to it.

"Before we take final leave of Simpson," writes ARNETH, "we must follow him into the lecture hall. There we find most prominent an uncommonly large number of preparations, casts and drawings, for Simpson preferred, whenever possible, to demonstrate to his audience the things of which he spoke. One need hardly mention how much understanding, attention and memory gained by

this practice Simpson enters, carrying in his hand the paper with his lecture notes. He commences speaking almost as soon as he comes into the room. His delivery is always fluent, and he very seldom looks at his notes whilst speaking. He rarely repeats himself, and very rarely forgets a point, which is in itself sufficient evidence of the care with which he prepares each lecture. The more eloquent his discourse becomes, the more apparent is his industry, and I ought to say that his speech often has something of that stormy rhetoric which we find again in his writings. His unusual activity made it impossible for him to remain seated during a lecture, and besides he had to stand in order to demonstrate objects, or to point with a short stick at a blackboard, on which an exact and extremely clear index of the subject he was treating was drawn up.

"When all is said, one need hardly mention that Simpson's pupils adored him and listened to him with rapt attention—for where could one find a teacher who possessed the gift of eloquent discourse in such a high degree, who was held in such high esteem in his native city, who combined a profound knowledge with great friendliness, and whose youthful audience could not but be inspired by him? Moreover, this audience was aware that the eyes of the whole obstetrical world were directed to their master, who often laid new experiments and ideas before this tribunal first of all. These are good reasons for the straining of attention to the highest pitch and for bringing about the most friendly relations between both parties.

"Incidentally, his lectures were held in a hall in the university, and were purely theoretical. The small Maternity Hospital, which admitted 374 persons during the years 1844-46, was some distance from the university, and the necessary supervision and instruction was provided by an assistant. As a means of teaching the polyclinic is also used, i.e. under the supervision of the

institution, which takes charge of the operative cases in particular, while those who wish may be delivered in their own homes by students who volunteer for the work. The number of such births amounted to 1,101 in the above-mentioned years. Every candidate for the medical doctorate must give proof of having attended a six-months' course of obstetrics, and of having personally conducted deliveries. It is also worth mentioning that for some years a ward of about twelve beds was reserved for Simpson in the General Hospital for treating the diseases of women and children. Simpson gave theoretical lectures on gynaecology at the university."

In the concluding chapter of ARNETH'S book a comparison is drawn between British and German obstetrics, in which the different theories of the origin of puerperal fever are also dealt with.

As we read in the *Proceedings of the Medico-Chirurgical Society of Edinburgh* (April 16, 1851), and in the *Edinburgh Monthly Journal of Medical Science* (July 1851, p. 72), "Dr Arneth of Vienna having read a paper on the cause of the puerperal fever at the Lying-in Hospital of Vienna, and Dr Moir having related the history of some cases which had lately occurred in his practice, Dr Simpson expressed his opinions on this question."

We extract the most important parts from the report of SIMPSON'S lecture.

"Continental accoucheurs generally did not understand exactly the kind or description of evidence upon which British practitioners founded their belief in the contagious communicability of puerperal fever. Some of the Continental writers on this subject seem to imagine that British obstetricians believe that puerperal fever was usually propagated directly from one patient to another, and not seeing this occur when a puerperal fever patient in their Continental hospitals lay by the side of another and healthy woman, they imagine that from this fact they had a disproof of the opinion of the contagious

communicability of the disease But in this country we do not believe that the disease is usually propagated in this way directly from individual to individual, but indirectly, through the medium of a third person, generally the medical attendant or nurse

“ It was upon evidence of this kind that British pathologists generally rested in founding their belief on the contagious communicability of puerperal fever And it was evidence of this kind which had intuitively driven them to adopt those means of prevention or avoidance, which are so highly necessary, in order to arrest the propagation of this fearful malady The measures proposed and so successfully adopted by Dr SEMMELWEIS in the Vienna Hospital were beautiful from their mere simplicity, but they were full also of a great lesson to us all They proved, in a manner beyond all dispute, the great importance of carefully ridding the fingers from all matters in the least degree likely to prove hurtful if inoculated into the vagina of a puerperal patient And no doubt, as Dr ARNETH had remarked, such matters were always present in the fingers as long as, despite even of common ablutions, they emitted a disagreeable animal odour, the presence of that odour being a perfect proof of the presence of morbid matter capable of producing the odour Drs SEMMELWEIS and ARNETH recommended for the purpose of ridding the fingers of this morbid matter, the use of chloride of lime Dr SIMPSON had used for the same object for years daily (or rather generally often during the day), a solution of cyanide of potash, which was more effective even than chloride of lime, and had this other advantage, that it removed readily and at once all such stains as the fingers of the accoucheur were apt to receive in treating uterine diseases—with nitrate of silver, iodine, and the like Dr SEMMELWEIS believed that animal matter, in a state of *putrefaction*, was the material which constituted the inoculable virus capable of being transmitted to puerperal patients,

and of producing puerperal fever in these patients Dr Simpson had strong doubts as to the idea of this matter being necessarily putrid being correct Dr Simpson had always believed and taught another theory, but not perhaps a perfectly correct one, in regard to the nature of the contagious material He believed that generally, if not always, the material which, when carried from one subject to another, could produce puerperal or surgical fever in a newly inoculable subject, was an *inflammatory secretion*, just as the inoculable matter of small-pox, cow-pox, syphilis, etc, was an inflammatory secretion obstetricians had now very decided proof of various kinds of morbid matters which were capable, when inoculated into the vagina, of leading to puerperal fever "

"Dr Simpson observed, that no doubt sporadic cases of puerperal fever frequently did occur traceable to no contagion or any other cause capable of being averted Dr ARNETH had particularly called the attention of the Society to the connection which was generally believed by British accoucheurs to exist between erysipelas and puerperal fever, and he had stated that the relation between these two diseases had not been observed in Vienna Dr Simpson, however, expressed his opinion, that now that Dr Arneth's attention had been directed to it, he and his compatriots would find such relations existing between these two diseases, as English accoucheurs spoke of

" In a disease like puerperal fever, it was the means of prevention that we were to look to, and to expect success in, more than the means of cure It was here, as elsewhere, evident that human life would probably be saved to a far greater extent by studying the means of preventing the causation of disease than by any study of the means of treatment, after disease was once actually commenced And when it was remembered that about three thousand women still died in childbirth in England and Wales alone every year, and that a large

proportion of these three thousand maternal deaths were deaths from puerperal fever, he thought he need not make any further observations on the importance of studying the means of prevention and prophylaxis in such a fatal and formidable malady, nor offer any apology for the length of the remarks which he had ventured to offer on this important subject "

SIMPSON himself abandoned the opinion that childbed fever is a specific contagious disease (*Edinburgh Monthly Journal*, November 1850) He later considered childbed fever to be identical with surgical fever "the fever is not the cause of the accompanying inflammations, but the fever as well as the inflammations are the result of a common cause, namely the original corruptions of the blood But what causes the corruption of the blood must be answered in a later era with a more developed pathologic anatomy, histology and chemistry "

SEMMELWEIS examined SIMPSON's objections and published a reply to them in his chief work, from the English translation of which we quote the following important observations

"By pyemia, I understand a disintegration of the blood, brought about by the introduction of a decomposed animal-organic matter

"I call childbed fever a variety of pyemia

"Childbed fever is not a contagious disease, for a contagious disease is understood as one which produces the *Contagium* by which it is spread, and this *Contagium* produces in turn only the identical disease in another individual Smallpox is a contagious disease, because smallpox produces the *Contagium* by which smallpox is again engendered in another individual, and no other disease Scarlet fever cannot be produced from a case of smallpox, on the contrary, one can never produce another disease from smallpox, e g a person ill with scarlet fever cannot cause smallpox in another individual

"But such is not the case with childbed fever, this

fever can be produced in a healthy puerpera by diseases which are not childbed fever, 'thus we saw this fever caused in the First Clinic in Vienna by an ichorous discharge from a medullary carcinoma of the uterus, also by the emanations from a carious knee-joint, we saw childbed fever caused in the First Clinic by cadaveric particles, which came from a variety of cadavera, etc

"But childbed fever cannot be carried from a puerpera ill with childbed fever to a healthy one, if a decomposed animal-organic matter is not transferred from one to the other

"Childbed fever is not a contagious disease but is communicable from an ill puerpera to a healthy one by means of decomposed animal-organic matter

"That the so-called epidemics in the lying-in hospitals were not caused by atmospheric influences, but by the introduction of decomposed animal-organic matter into the individual case from without, is demonstrated by the more favourable state of health among the puerperae in the lying-in hospitals in those countries where English views prevail, as in Ireland and Scotland, in comparison with the bad state of health among the puerperae in German and French lying-in hospitals. There are no reasonable grounds for the assumption that the atmospheric influences, which carry off the puerperae in such enormous numbers in the German and French lying-in hospitals, should not be able to do the same in England, Scotland and Ireland

"Accordingly, the difference in the state of health of the puerperae in the countries cited does not lie in the difference in the atmospheric influences. But the views of the English physicians on the origin of childbed fever are essentially different from the opinions which the French and the German physicians hold on the same subject

"The English physicians regard childbed fever as contagious, in France and in Germany the opinion always

prevailed that childbed fever is not contagious. The latter is also my conviction. But childbed fever is transferable from a sick gravida, parturient or puerpera to healthy gravidæ, parturients and puerperæ by means of a decomposed substance, which the diseased gravida, parturient or puerpera produces.

"The English, proceeding on the opinion that childbed fever is contagious, do not attend a healthy gravida, parturient or puerpera, if they have previously attended a sick gravida, parturient or puerpera, without having washed their hands with chlorine water, or having changed their clothes, and if the number of cases of childbed fever increases, even go away on a trip or give up practice entirely for some time. English physicians do not attend healthy gravidæ, parturients or puerperæ after an autopsy on the cadaver of a puerpera, without previously washing their hands in chlorine water, or having changed their clothes.

"In all those cases in which the sick gravida, parturient or puerpera does not produce decomposed matter, the English physicians do something rather superfluous, but in all cases where decomposed matter is produced, the English physicians, with the idea of destroying a Contagium, destroy the decomposed matter which, if transferred to a healthy gravida, parturient or puerpera, would cause childbed fever. After the autopsy on the cadaver of a puerpera, the English physicians, with the idea of destroying a Contagium, destroy the decomposed matter with which their hands have been contaminated with chlorine water.

"In English maternity hospitals are thus prevented all cases of the disease which in German and French lying-in hospitals would originate in puerperal cadavers or in such gravidæ, parturients and puerperæ, hence the more favourable state of health among the puerperæ in the maternity hospitals, in which childbed fever is regarded as contagious."

By his postulate concerning the prevention of infection, SEMMELWEIS had won a place of eminence for himself, not only in obstetrics but also in operative gynaecology and in surgery. As early as 1849 Karl HALLER concluded his address by saying "The importance of SEMMELWEIS's experiments for lying-in hospitals and for hospitals in general, especially for the surgical wards, is so immeasurable that it appears worthy of the attention of all men of science." Thus, although SEMMELWEIS is the originator of antiseptics, or still more, of asepsis, LISTER produced his great work uninfluenced by SEMMELWEIS's discovery. He writes "When in 1865 I first applied the antiseptic principle to wounds I had not heard the name of SEMMELWEIS and knew nothing of his work. When twenty years later I visited Budapest, where I was received with extraordinary kindness by the medical profession and the students, SEMMELWEIS's name was never mentioned, having been, as it seems, as entirely forgotten in his native city as in the world at large. It was some time after this that my attention was drawn to SEMMELWEIS and his work by Dr. Duka, a Hungarian physician practising in London. But while SEMMELWEIS had no influence upon my work, I greatly admire his labours and rejoice that his memory will be at length duly honoured."*

* In 1843, Oliver Wendell HOLMES read to the Boston Society for Medical Improvement his paper on the contagiousness of Puerperal Fever, in which he affirmed that women in childbed should never be attended by physicians who have been conducting post-mortem sections or cases of puerperal fever, and that washing the hands in calcium chloride and changing the clothes after leaving a puerperal fever case was likely to be a preventive measure. In 1855, he reiterated his views and stated that one "Senderein" had lessened the mortality of puerperal fever by disinfecting the hands with chloride of lime and the nailbrush. This "Senderein" was SEMMELWEIS.

CHAPTER X

THE OCULISTS v ARLT, STELLWAG AND ED JAGER

MEANWHILE, in Vienna in 1856, Carl Braun von FERNWALD, former assistant in the obstetrical clinic for medical students and one of SEMMELWEIS's most bitter opponents, succeeded KLEIN as professor of obstetrics. His claim to remembrance is that he instituted a gynaecological section in connection with the obstetrical clinic and insisted on a large ventilating system and improved hygienic measures in the maternity hospital. As a result the average mortality over a period of twenty years diminished to only 1 per cent. He was among those obstetricians who adopted the practice of disinfection while ignoring SEMMELWEIS. BRAUN enriched and notably improved the available obstetrical instruments (colpeurynter). We may direct particular attention to the credit he deserves for having improved SIMPSON's "cranioclast," for it was due to BRAUN that it became a practical extraction instrument.

When, as a result of the progress in gynaecology, the Maria Theresia Women's Hospital was founded in Vienna, the specialist Hermann BEIGEL was given the directorship. He had been trained in Vienna, but had gone to England early in his career and had worked in London as physician to the Metropolitan Free Hospital and as lecturer on skin diseases at Charing Cross Hospital, but afterwards devoted himself entirely to gynaecology. Besides other special works he published a German translation of *Clinical Notes on Uterine Surgery*, by Marion SIMS, as well as his own handbook of gynaecology.

Concerning Pediatrics, it has to be mentioned that a special clinic for children's diseases was opened in 1851.

at the St Anna Hospital L MAUTHNER, the founder of the first children's hospital in Vienna, became chief of that clinic. He wrote on brain diseases of children and on hydropathy.

Among the foremost members of the teaching staff of the Vienna School after 1856 there was the celebrated ophthalmologist Ferdinand VON ARLT, whose lectures were attended by physicians from all countries in order to hear the views which he had based on his own experience. ARLT deserves credit for having raised ophthalmology from its position of subservience to surgery to that of an independent science, for having comprehended the aetiological conditions of eye diseases, and for having linked the study of ophthalmology with pathologic-anatomical research. He was the first to establish that myopia was due to a lengthening of the sagittal diameter of the eyeball, and he was responsible for the introduction of written test-cards. ARLT was one of the leading medical men of his time, and not only as a scientific investigator but also as an outstanding operator. Contemporary with him in Vienna were two other brilliant ophthalmologists, STELLWAG, von CARION and Eduard von JAEGER. STELLWAG's *Lehrbuch der praktischen Augenheilkunde* was translated into English (1868, 1873) under the title *Treatise on the Diseases of the Eye, including the Anatomy of the Organ*. Among his numerous works those on pathological histology and his work on the defects of accommodation of the eye are particularly noteworthy. STELLWAG in 1869 drew attention to the previously unnoticed sign of absence or incompleteness of the involuntary winking as a symptom of Grave's disease.

Eduard von JAEGER spent his whole life in making practical use of the ophthalmoscope invented by von Helmholtz in 1851. His *Atlas der Ophthalmoskopie* is unsurpassed. His *Schriftskalen* were published in all languages, the English versions being entitled *Type-scales* (Vienna, 1865) and *Test-types for the Determination of the Acuteness*

of Vision, Myopia, and Range of Accommodation, corresponding to the Schrift-Skalen of Edw Jaeger (1868) Jaeger's most famous pupil was the oculist Ludwig MAUTHNER, an excellent eye-surgeon and investigator, His work on the sympathetic diseases of the eye appeared in English translation (1881) Jaeger's successor as professor of ophthalmology was Ernst FUCH, who won world-fame as a lecturer, investigator and brilliant operator, and made the Viennese ophthalmological clinic the focus for ophthalmologists for decades His pupils came from all countries, and he enriched science by an immense number of works on the anatomy and physiology of the eye, on ophthalmological pathology and on clinical practice His handbook of eye-diseases appeared in fifteen editions, and was translated into almost all civilized languages It appeared in English with the title *Textbook of Ophthalmology Authorized translation from the 12th revised and greatly enlarged German edition, with numerous additions by Alexander Duane* (1899)

The introduction of *cocaine* as a local anaesthetic was also due to the Viennese ophthalmological school, and operative ophthalmology was thereby greatly advanced The chief credit for this belongs to Carl KOLLER, assistant physician in the "Allgemeines Krankenhaus" KOLLER undertook a series of experiments on animals in the laboratory of Professor STRICKER, in which he found that complete anaesthesia of the eye, lasting on an average ten minutes, followed the introduction of a 2 per cent solution of the alkaloid On September 15, 1884, considerable interest was aroused by KOLLER'S communication made at the Ophthalmological congress at Heidelberg

The reaction from therapeutic scepticism, together with the development and interest in new special branches of medicine which was characteristic of the rising "Young Vienna school" of the sixties, may be traced in no small part to the influence of the famous clinician OPPOLZER Until 1871 he was teaching by the side of SKODA More

than any other teacher he encouraged youthful talents and found his greatest pleasure in setting their feet in the path they should follow. He was particularly admired on account of his "snap" diagnosis, but he published no major work, his varied contributions to medical science being published in journals in the form of essays. To indicate the importance of these, we need only mention that his name is associated with the pathology of Pertyphlitis, Ren-mobilis ("floating kidney"), and Haemophilia, and that he recognized the indication for paracentesis in hydrops pericardii, etc. But of special importance were his achievements in the field of neurology, which had been all too long neglected in Vienna. In later years, no lesser man than CHARCOT recognized the value of this branch of OPPOLZER's work, and quoted his studies of myelitis, multiple sclerosis, etc. OPPOLZER also favoured the use of electrotherapy and hydrotherapy for the treatment of nervous diseases and encouraged their scientific development. The two chief names to be remembered in this connection are those of MORIZ BENEDIKT and Wilhelm WINTERNITZ, the former being the chief representative of electrotherapy in Vienna, and the latter the exponent of hydrotherapy. Both had followers and pupils from all countries. BENEDIKT, who was lecturer in electrotherapy in 1861, advanced this branch of medical science by the introduction of new methods. His work, *Elektrotherapie*, was published in 1868. WINTERNITZ, lecturer in hydrotherapy in 1865, published besides numerous monographs (experimental works on thermal influences on the organism), the standard works, *Vorlesungen ueber Hydrotherapie* (Vienna, 1877-80) and *Die Hydrotherapie auf physiologischer und klinischer Grundlage* (2 vols, 1877-79). His model institute for the cold-water cure in Kaltenleutgeben near Vienna gained world-wide fame. Oppolzer also favoured balneology whose representative lecturer was in Vienna JOS SEEGEN.

Under ROKITANSKY's influence Ludwig TURCK studied

the pathological anatomy (histology) of the spinal cord, and Theodor MEYNERT the pathological anatomy of the brain

Quite early in his career, when he was only a junior physician, TURCK was already busily engaged with neurology. As a fruit of his studies there appeared *Abhandlung ueber Spinal-Irritation nach eigenen, groes-senteils im Wiener Allgemeinen Krankenhaus angestellten Beobachtungen* (Vienna, 1845). Although he did excellent work in the department of nervous diseases, which was established for him at the Allgemeines Krankenhaus, it was not until 1857 that he became a senior physician. About this time he published numerous neurological papers the value of which was not sufficiently appreciated until later.

As regards "spinal irritation," this was a conception of disease (which was later abandoned and replaced by that of neurasthenia and functional neurosis), for which we are indebted to English neurologists (e.g. C. BROWN, T. PRIDGIN TEALE, W. and D. GRIFFIN, JOHN MARSHALL, etc.), and which may be ultimately traced to the doctrine ("irritation," "constitutional irritation") of the surgeon Benjamin TRAVERS. This system of TRAVERS evolved, with the aid of BELL's law and the doctrine of reflex-movements (MARSHALL HALL), into the theory of *spinal irritation* first formulated by PARISH.

The following may be mentioned as the most important of TURCK's neurological achievements. He was the first to discover secondary degenerations and investigated the microscopic anatomy of tabes dorsalis and multiple sclerosis. He was also the first to describe the anatomical condition of the retina in a fatal case of nephritis (Retinitis albuminurica) and to correlate retinal haemorrhage with tumours of the brain.

MORIZ ROSENTHAL was a pupil of TURCK and his successor as chief of the outpatient department for sufferers from nervous diseases. His literary output was

large and he gained an important reputation in neuropathology. Particularly outstanding among his publications were *Die Elektrotherapie, ihre Begründung und Anwendung in der Medizin* (Vienna, 1862, 1873), and *Klinik der Nervenkrankheiten* (Vienna, 1870, 1875). The latter work was translated into English with the title, *A Clinical Treatise on the Diseases of the Nervous System With a preface by Professor Charcot, translated from the author's revised and enlarged second edition by L. Putzel* (London, 1881).

OPPOLZER's successor as director of the Second Medical Clinic was his former assistant Heinrich v. BAMBERGER, a man of great knowledge and outstanding diagnostic ability. He had previously held the position of Professor in Würzburg for some time, and had published there, among other works, a paper *Über Bacon von Verulam*. The classic *Lehrbuch der Krankheiten des Herzens* (Vienna, 1857) is the best known of his medical works. He writes in the preface to this work "France and England were the first to follow the new paths opened up by Corvisart, and there are now many names associated with the study and advancement of our knowledge of heart diseases, both as a whole and individually, for example, the Englishmen HOPE, LATHAM, WALSHE, BELLINGHAM, and STOKES." In the literature quoted by BAMBERGER we also find the writings of BURNS, ELLIOTSON, WILLIAMS, DAVIES, WARDROP, FURNIVALL, Scott ALLISON, HODGSON, and GRAVES, as well as essays and reports from the *Transactions of the British Association*, the *London Medical and Surgical Journal*, *Medico-chirurgical Transactions*, *Guy's Hospital Reports*, *Edinburgh Medical and Surgical Journal*, *Dublin Journal*.

Theodor BILLROTH, the master of surgery from Zurich, succeeded the surgeon SCHUH in 1867 and became one of the greatest figures in the Vienna Medical School. Within his art he combined a most profound knowledge, and the surgeon's capacity for daring action was based on the

pathological, clinical and experimental investigations of the scientist. Upon German surgery of the nineteenth century he impressed the stamp of the bold and unexpectedly successful practice of visceral surgery, a practice which contrasted strongly with that of earlier surgery, which was on the whole rather a surgery of the limbs. BILLROTH was the first to carry out successful resections of the oesophagus (1872) of the pylorus in carcinoma of the stomach (1881), and total excision of the larynx (1873). During the period 1878-83 he performed an unusually large number of intestinal resections and enterorrhaphies, and indeed he is especially remembered as the surgeon of the alimentary canal. BILLROTH founded a school of surgery in Vienna which produced many eminent clinicians, natives not only of Austria and Germany, but of many other countries also. CZERNY, MIKULICZ, WOLFLER, GERSUNY, VON EISELBERG, GUSSENBAUER were all particularly famous pupils of BILLROTH. His universally admired work, *Die allgemeine chirurgische Pathologie und Therapie*, a series of fifty lectures, appeared in numerous editions, was translated into ten languages, and produced by the New Sydenham Society as *Lectures on Surgical Pathology and Therapeutics. A handbook for students and practitioners. Translated from the eighth edition* (2 vols., London, 1877-8). Among his other works which appeared in English translation are *Clinical Surgery. Extracts from the reports of surgical practice between the years 1860-1876. Translated by C. J. Dent* (London, 1881), and *On the Mutual Action of Living Vegetable and Animal Cells. Translated by F. A. Junker von Langeegg*.

CHAPTER XI

GARCIA'S INVENTION OF THE LARYNGOSCOPE

THE system of *medical specialization* affected no school more profoundly than that of Vienna. This seat of learning was long the main place of pilgrimage for English-speaking medical men who desired to continue their studies abroad, especially in *ophthalmology*, *laryngology* and *otology*, all of which were well represented in Vienna.

Laryngology and rhinology could not become true sciences, systematically ordered and carefully worked out in all respects before a method had been found which would permit the visual inspection of the dark regions of the throat and naso-pharynx.

The great importance of diseases of the upper air passages was not recognized until the beginning of the nineteenth century, and in the first half of the century appeared a great number of works dealing with the specific and general affections of this region. To these belong among others JOHN CHEYNE'S *The Pathology of the Membrane of the Larynx and Trachea* (Edinburgh, 1809), W. H. PORTER'S *Observations on the Surgical Pathology of the Larynx and Trachea* (Edinburgh, 1826), and F. RYLAND'S *A Treatise on the Diseases and Injuries of the Larynx and Trachea* (London, 1837). In this period the anatomy of the larynx was almost completely mapped out. The physiology of the muscles and nerves was studied amongst other things by ROBERT WILLIS, who occupied himself particularly with the mechanics of the joints. The pathology of the larynx paid special attention to croup, to acute inflammation, to "phthisis laryngea" and to swellings of the larynx. Only ROKITANSKY'S work, however, led to a separation of tuberculous disease of the larynx from other destructive affections such as

syphilis, carcinoma, etc., which were included with it under the term "phthisis laryngea." Everything which was known about the nose and throat at the end of this epoch is collected together in a work by SKODA's successor, DUCHEK.

BOZZINI may have been the first to attempt an illuminated examination of the cavity of the larynx. After the appearance of his work (1807), reports are to be found of attempts to reach the same goal, but these were in the main unsuccessful. Benjamin GUY BABINGTON, an extremely erudite and ingenious physician of Guy's Hospital, was expert at examining the throat with the aid of mirrors. One of these, which was made specially for the larynx, represents the first laryngoscope, and with this BABINGTON is said to have seen the laryngeal inlet in 1829. The Scottish surgeon LISTON wrote in his *Surgery* that one could often obtain a view of oedematous tumours of the larynx by means of a mirror such as dentists use, which is provided with a long handle. After being dipped into hot water it may be introduced into the fauces with the mirror surface downwards.

Even earlier, WARDEN and AVERY used artificial light, and AVERY used a reflex mirror fixed to the forehead. But only Manuel GARCIA, the Spanish singing master, was completely successful. GARCIA had frequently entertained the idea of using a mirror for studying the action of the larynx during singing, but he had always rejected it as impracticable. During his stay in Paris in September 1854, he finally decided to resolve his doubts by making a practical investigation. He visited Charrière and enquired if he had a small mirror fitted with a long handle, suitable for inspection of the throat. Charrière replied that he had a small dental mirror which he had sent to the London Exhibition in 1851, but which nobody had wanted. GARCIA bought it, and armed with a second hand-mirror, he went to his sister, very impatient to commence his experiment. He warmed the mirror in hot

water, dried it thoroughly, and placed it against the uvula. When he had obtained illumination by reflecting sunlight with the hand-mirror, GARCIA saw the larynx wide open in front of him, and the first laryngoscope had been made. He was able to determine by unaided vision that the production of sounds is due to the lower vocal cords. He found it possible to study the register, the influence of the epiglottis on the quality of the sound, etc. In the following spring, on May 24, 1855, he communicated to the Royal Society, through Dr William SHARPEY, a paper entitled "Physiological Observations on the Human Voice."

In the summer of 1857, in the "Allgemeine Krankenhaus" in Vienna, Ludwig TURCK, the neurologist, succeeded, after many failures, in converting the laryngoscope into a generally useful instrument. To this end he had made many studies on cadavers and on sick people, but because he worked exclusively with sunlight he was forced to interrupt his investigations for some time in winter.

Meanwhile the physiologist Johann CZERMAK, also in Vienna, began investigations of his own with a mirror borrowed from TURCK. He came to the conclusion that the invention of the laryngoscope was as significant and important as, for example, that of the uterine speculum.

In a publication dated March 27, 1858, CZERMAK clearly describes the use of the instrument, recommends artificial light and a concave mirror with a hole bored through it. He also describes the warming of the mirror and the most suitable place and position for it in the mouth. He mentions that the posterior nasal orifices (choanae) and the upper part of the pharynx can be examined with the mirror reversed. He expresses the hope that the laryngoscope will enable the eye to become a surer guide to the hand, and recommends the general and widespread use of the instrument. In the session of the Gesellschaft der

Arzte on April 9, 1858, TURCK also gave a report on the results which he had obtained up to date, demonstrated his mirror, and claimed priority for himself in this method of examination. At this meeting CZERMAK recognized TURCK's priority, and repeated his acknowledgment in binding form by the publication of a second report, in which he gave an account of his further experiments and announced that he had also seen the bifurcation. Finally, he pointed out that it only remained for the practitioner to develop the method to such an extent that it should actually fulfil the purpose expected of it. On the other hand, TURCK made statements which referred in the main to the technique alone and concluded with the remark that he was far from entertaining too sanguine hopes of the value of the laryngoscope in practice.

The question of priority remained a subject of dispute for years, because CZERMAK later maintained that only his successes induced TURCK to resume his abandoned experiments, and that until he had demonstrated its value, TURCK had not realized the great significance of the laryngoscope in practical medicine. The fact that CZERMAK, in 1859, began a series of visits to Germany, France and England, certainly gave great impetus to the spread of laryngoscopy, but this also spread the completely false impression that he was the sole inventor of the new method. He certainly introduced artificial light, developed the method, and enriched physiology by his researches and clinical experience by his reports, nor can it be denied that he was the founder of rhinoscopy. His little work, *Kehlkopfspiegel und seine Verwertung für Physiologie und Medizin* (Vienna, 1860, 1863) was soon translated into various foreign languages. It appeared in English with the title *On the Laryngoscope and its Employment in Physiology and Medicine* (London, 1861), being translated by G. D. GIBB and published by the New Sydenham Society.

In spite of this, the chief credit for the foundation of

laryngology must go to TURCK, whose numerous works cover the whole field, the pathology and the therapeutics as well as the methods of examination, for the perfection of which he laboured tirelessly. His classic work, *Klinik der Krankheiten des Kehlkopfs und der Luftröhre* (Vienna, 1866) with its accompanying Atlas will always remain an unfailing mine of observations for every scientific laryngologist. One of his works appeared in English with the title, *Clinical Researches on Different Diseases of the Larynx, Trachea and Pharynx, preceded by historical remarks on the practical use of the laryngoscope* (Vienna, 1862, London, 1863). Between them, TURCK and CZERMAK made Vienna the leading school of laryngology, and everywhere arose enthusiastic pupils and collaborators. In Vienna the earliest of these were SEMELEDER and STOERK. The former, who had demonstrated the use of the laryngoscope in the Gesellschaft der Artze on May 28, 1858, summed up his experiences in brochures on rhinoscopy and laryngoscopy (1861 and 1863), but he left Vienna in 1866. In the same year was published his work on *Rhinoscopy and Laryngoscopy, their value in practical medicine*. Later on, there worked in Vienna KARL STOERK, JOHANN SCHNITZLER and LEOPOLD SCHROETTER von KRISTELL, who were world famous masters of laryngology and rhinology for decades. To them we owe many valuable works of a pathological, clinical and technical nature, as well as comprehensive text-books on the diseases of the larynx, the nose and throat. Their outstanding activity as teachers was even more important. SCHROETTER promoted the establishment of the first university clinic of laryngology and produced its annual reports as well as his *Vorlesungen ueber Krankheiten des Kehlkopfes und der Luftröhre* (Vienna, 1892, 1896). It was SCHROETTER who promoted the establishment of the Tuberculosis sanatorium at Alland, near Baden. In 1891, STOERK took over the directorship of the newly established clinic. In 1893 ST. CLAIR THOMSON was a pupil of Stoerk, he was

shown with pious solicitude the original beautifully coloured drawings which had gone to form TURCK's atlas

The British literature on laryngoscopy commences in the early sixties with the works of John BISHOP, Edward N SIEVEKING, T. J WALKER, P C SMYLY, George JOHNSON, and Ebenezer WATSON But the most distinguished workers in this field were GIBB, Morell MACKENZIE, and Felix SEMON

George Duncan GIBB was an acknowledged authority on diseases of the larynx even before the laryngoscope was used, and published his work, *On Diseases of the Throat, Epiglottis and Windpipe*, in London in 1860 Following the translation of Czermak's work, he added to the title of the second edition (1864) the words *as reflected by the laryngoscope, a complete manual* He also wrote *The Laryngoscope, illustrations of practical application, etc* (London, 1863) and *The Laryngoscope in Diseases of the Throat, with a chapter on Rhinoscopy* (London, 1868)

Morell MACKENZIE, the father of English laryngology, spent a year at Paris and another in Vienna, where TURCK instructed him in the new art, visited CZERMAK in Pest, and was one of the first to use the laryngoscope in Britain In 1863 he founded the Hospital for Diseases of the Throat in Golden Square, London, in which more than a hundred thousand patients have been treated, and which served as a pattern for similar institutions throughout the country Among the chief of his many works are *On the Pathology and Treatment of the Larynx* (1863), *The Use of the Laryngoscope in Diseases of the Throat* (1865, 3rd ed 1871), and *Diseases of the Throat and Nose* (2 vols, 1880-84), which was the most comprehensive and important text-book of the time, and was translated into French and German

Felix SEMON, after some years on the staff of the Hospital for Diseases of the Throat, Golden Square, was appointed head of the throat department at St Thomas's Hospital, where he quickly gained a wide reputation In 1888 he was appointed laryngologist to the National

Hospital for the Paralysed and Epileptic, where he was associated with Sir Victor HORSLEY in researches which led to the formulation of *Semon's law*, which declares "that in all progressive organic lesions of the centres and trunks of the motor laryngeal nerves the abductors of the vocal cords succumb much earlier than the adductors" His researches led to the thyroid treatment of myxoedema, and his early diagnosis of cancer of the larynx enabled him to perform many successful operations by laryngo-fissure SEMON helped to found the Laryngological Society of London.

Otology was almost entirely neglected by the first Vienna School VAN SWIETEN occasionally mentioned ear affections while discussing other diseases STOLL's accounts of diseases of the ear in his case-histories are worthless It is true that Josef FRANK wrote at length on these diseases in his work *Praxeos med universae praecepta* (1821), but there are to be found here no diagnostic points which would aid identification of the varieties of the disease The work of Josef VON VERING, *Aphorismen uber Ohrenkrankheiten* (Vienna, 1834), also stands on a very low plane The number of Viennese dissertations on diseases of the ear is extremely small The Viennese ear specialist Ignaz GRUBER (1841) is indeed often regarded as the inventor of the first undivided ear speculum, but his priority was contested The Viennese physician VON GAAL was the first in Vienna to give more consideration to the anatomy of the ear, and to allow more space for methods of examination in his text-book, *Die Krankheiten des Ohres und deren Behandlung* (Vienna, 1841) This is explained by the fact that he followed the best English, French and German sources in the compilation of his work, taking Wharton JONES especially as his guide. But he also gives his own case-histories, and on the basis of these draws his own conclusions

During the seventeenth and eighteenth centuries advance had been made in the anatomy and the physiology

of hearing by British researches (BACON, Thomas WILLIS, John ELLIOTT, Alexander MONRO, Joseph Fenn SLEIGH). But a more serious attempt at practical otology was not made before the beginning of the nineteenth century. John Cunningham SAUNDERS was the first to draw up a plan for the foundation of a London dispensary for curing diseases of the ear in 1804, and in 1816 John Harris CURTIS had the privilege of putting it into effect. In the provinces—in Hull for example—dispensaries for curing diseases of the eye were most hospitable to otology.

Of the British literature of the first half of the nineteenth century, we may mention the writings of SAUNDERS (1806, 1817, 1829), CURTIS (1817, 1818, 1830, 1836, 1840), Thomas BUCHANAN (1823, 1825, 1828), T. SWAN (1818), T. KENNEDY (1813), William WRIGHT (1818, 1826), WEBSTER (1836), George PILCHERS (1838), John STEVENSON (1839), Joseph WILLIAMS (1840), James YEARSLEY (1839).

YEARSLEY's name is connected with his invention of the artificial eardrum, which he produced in the form of a small ball of cotton-wool. It was YEARSLEY, too, who condemned the low standard of otology in England at that period in comparison with France and Germany in the following words: "It must be observed, that in no department of medical science are we so much behind our continental neighbours as in the treatment of aural disease. The explanation of this fact may be found in the statement just made, that, in this country, the subject has hitherto been treated only by non-professional persons."

It was reserved for Joseph TOYNBEE, with his penetrating insight, his rare energy and talent, to lay the foundation for a new special science of equal standing with other specialities, namely, scientific otology. This he did by his work on the pathological anatomy of the ear. "The labours and investigations of Mr TOYNBEE have effected

more for aural pathology than those of all his predecessors either in England or on the Continent" (WILDE)

Toynbee admits that the epoch-making works of ROKITANSKY, which had appeared shortly before, were his inspiration. Favoured by the material which was placed at his disposal by various London hospitals and anatomical institutions, TOYNBEE produced a work which will form the basis of the pathological anatomy of the ear for all time. Between the years 1841 and 1855, the results of his investigations were published in the *Medico-Chirurgical Transactions* in six reports, and in 1862 appeared his major work on the subject.

Already in 1853, TOYNBEE's contemporary, Robert WILDE, had published a work based on many original experiments, and introducing new diagnostic examination methods. This was his *Practical Observations on Aural Surgery*. WILDE, who far surpassed TOYNBEE as a clinician, could truly say "I have laboured to rescue the treatment of ear diseases from empiricism, and found it upon the well-established laws of modern pathology, practical surgery, and reasonable therapeutics."

James HINTON, an ear specialist in Guy's Hospital, who worked as TOYNBEE's assistant from 1863, distinguished himself in this field. WILDE, in the historical sketch in his chief work, was able to say with justice that in the middle of the nineteenth century otology held a higher place in England than that which it occupied in other European countries.

So it was that the young Viennese physician Adam POLITZER, who was destined to earn for the Vienna school a particularly high place in the history of otology, visited England in the course of a study-tour which had led him first to Wurzburg (KOLLIKER, TROLTSCH) and then to Paris (MËNIÈRE, Claude BERNARD). In England he devoted himself to the study of TOYNBEE's rich collection of pathologic-anatomical preparations under the personal guidance of the master.

POLITZER, whose world fame was founded on the experiments which he published in 1863, on the driving of air into the external auditory meatus, was the first to obtain the lectureship in otology in Vienna (1861), and worked as a distinguished investigator, as brilliant teacher and physician until 1907 (from 1870 as extraordinary and from 1896 as ordinary Professor)

His comprehensive scientific activity included the anatomy, histology and pathological anatomy of the ear, as well as the diagnosis of ear diseases and the building up of the clinic devoted to their treatment. His works, which number more than a hundred, cover the whole field. His *Lehrbuch der Ohrenheilkunde*, which appeared in many editions, was widely circulated and was translated into French, Spanish, and into English in 1883 with the title, *A Text-book on Diseases of the Ear and Adjacent Organs*. POLITZER's courses were attended by thousands of foreign physicians and many ear specialists were trained by him. Among his British pupils were A. E. CUMBERBATCH, A. H. CHEATLE, R. LAKE, Edward LAW, F. H. WESTMACOTT, Creswell BABER, P. MCBRIDE, James Patterson CASSELS, Thomas BARR and PALMER.

Josef GRUBER in the Allgemeinen Krankenhaus and Victor URBANTSCHITCH at the Vienna Allgemeine Poliklinik, worked in association with POLITZER. GRUBER advanced the anatomy and surgery of the ear by many works, and enjoyed an excellent reputation as a teacher. His text-book appeared in English as *A Text-book of the Diseases of the Ear Translated from the second German edition, edited by Edward Law and Coleman Jewell* (London, 1890, 2nd English ed. 1893). An impressive list of well-known Austrian otologists comes from POLITZER's and GRUBER's school.

URBANTSCHITCH contributed much to the progress of otology by his works, and he also worked on physiological and psycho-physiological themes with particular pleasure.

We owe to SEMON, who on TRAUBE'S advice received his special oto-laryngological training in Vienna, an interesting account of the conditions there in the year 1874 "Vienna was at the height of its fame for post-graduate instruction of medical men from all over the world Quite deservedly too Although most of the famous men (Skoda, Oppolzer, Turck, Hyrtl, etc) had passed away, and though but few of them (Rokitansky, Hebra, Arlt) still survived, yet there were among the teachers of that period Billroth, Bamberger, Schroetter, Politzer, Kaposi, Stoerk, and others Above all, the organization of the post-graduate courses was exemplary "

Concerning the specialist courses, SEMON wrote "I still have the pleasantest recollections of these wonderful practical arrangements, and of the amiability shown by the teachers and their assistants to the beginners "

However, he found several features to blame, such as "the unconcealed haughtiness with which some of my teachers, especially the laryngologists, looked down upon everything that had not originated in the Vienna school," and, further "The open personal animosity of the various teachers to each other necessarily made a bad impression upon the foreign medical man " But most of all, SEMON was "horrified by the want of human feeling shown in the various clinics In Hebra's skin-clinic, that indifference occasionally increased to sheer brutality In Vienna hospitals the patient was merely regarded as 'material' The poor sick submitted to this with a dull resignation which surprised me at first as much as the want of sympathy of some of their medical attendants "

But where there are deep shadows there must also be strong light, and so Sir Felix SEMON concludes with the following words "I remember my medical sojourn in Vienna with genuine gratitude, and I have endeavoured to give expression to that feeling in my obituary notices of teachers and friends—Stoerk, Schnitzler and von Schroetter (*Internationales Centralblatt für Laryngologie*,



SIR WILLIAM OSLER
1849-1919

vols 15, 19 and 24) All three were interesting personalities, whose characteristics I endeavoured to preserve in describing them for the laryngologists of posterity I had a genuine admiration for the esteemed senior of Viennese otology, Adam POLITZER, and until 1913 I firmly believed that my friendship with Ottokar Chiari, the most prominent successor of the earlier Vienna laryngologists, would remain undisturbed till the end of our lives The war, however, to my great sorrow, put a dramatic end to it "

We owe to Sir William Osler an excellent description of the medical life at this time Osler arrived on New Year's Day, 1874, in Vienna and worked assiduously there for five months He filled up his time with all the courses he could squeeze in, as the following account he sent home to the *Canada Medical and Surgical Journal*, 1873-74, makes evident

March 1, 1874

" I arrived here on New Year's day With the aid of a Yankee friend, I soon obtained a room in Reitergasse, close to the Krankenhaus The Krankenhaus is arranged in nine courts, occupying a whole district in the city, and accommodating more than two thousand patients We were not long in getting to work, and our daily programme is as follows

"At about half-past eight we go to Hebra, who visits his wards at this hour, and at nine we go to his lecture-room Undoubtedly he is *the* lecturer of the Vienna School, and he combines the humorous and instructive in a delightful way I generally go every other morning to Bamberger, who lectures at the same hour on general medicine He is a splendid diagnostician, but is, I think, inferior to those Berlin giants, Traube and Frerichs At ten we have another hour on the skin, from Neumann, who has the run of Hebra's wards, and an out-patient department of his own He enters more particularly into

individual cases than Hebra and gives us more differential diagnosis At eleven, we go to Widerhofer the professor in the children's department, and have there in the first half-hour a series of selected cases, and in the second a lecture There are not many in his class, so that one has a good chance to examine the children oneself At twelve I attend a course on ear diseases with Politzer, not that I am going to make a speciality of them, but I thought it well worth while, when an opportunity occurred, to make their acquaintance Politzer is good and shows us a great many cases, and makes us pass the Eustachian Catheter daily At one, Braun the Professor of Obstetrics, lectures, but more of the Clinique shortly Between two and four we dine, and take our constitutional, at four we have a class on the laryngoscope This is a six weeks' course, and I am just beginning another and take kindly to the larynx At five we have one of our very best classes, viz obstetric operations, with Bandl, Braun's first assistant, in which after as much theory as is needful, work begins on the cadaver I begin next week to go on duty about every fifth or sixth day and hope to get three or four forceps cases before leaving I do not attend any surgical classes, having as you see my hands full, but we go to Billroth occasionally, and I shall take a course of operations from his assistant before I leave Americans swarm here, there are fifty or sixty of them at least, and Great Britain is represented by five or six Edinburgh men and a couple of Londoners "

In one of his notes written years later, Osler says "On leaving Vienna I could not resist Billroth's *Cocobacteria septica*, an expensive quarto, with beautiful plates, a curious pre-Kochian attempt to associate bacteria with disease, and now of value only as illustrating the futility of brains without technique "

CHAPTER XII

NEW METHODS OF ANAESTHESIA AND LISTER'S ANTISEPTIC METHOD

Two achievements were of the greatest importance for the development of surgery and its allied branches—anaesthetics and the antiseptic treatment of wounds—and for both we have to thank physicians of the English-speaking world. As regards anaesthesia, after 1849, SIMPSON brought about a general change in favour of chloroform, but a cry soon arose for the reinstatement of ether. While the French surgeons supported their arguments exclusively by their clinical experience, the British sought to establish experimental physiological facts to which they could relate their experience acquired at the operating table. A "Chloroform Committee," set up by the Royal Medico-Chirurgical Society in 1865, recommended a mixture of chloroform (2 parts) and ether (3 parts) so as to compensate the harmful action of chloroform on the heart by the stimulating effect of ether on that organ. As for the position adopted by the Vienna school, we may mention first that BILLROTH in 1868 pointed out concerning the alleged deaths from chloroform that no proof for such a view was forthcoming from post-mortems.

The distinguished surgeon FRANZ VON PITHA worked at the Academia Josephina, which had been reopened in 1854. As a young man he had made a study-tour in France and England. It was he, who, in 1861, was the first to investigate the simultaneous use of two methods of anaesthesia. He followed up the inhalation of an ether-chloroform mixture by the injection of a solution of belladonna extract per rectum. The Vienna school (VON LINHART, BILLROTH) held to the use of mixtures of liquid agents (alcohol, chloroform, ether).

SEMON wrote in his autobiography that at a time when LISTER'S antiseptic treatment of wounds was already quite widespread in Germany, in Britain, apart from Glasgow and Edinburgh, the practice was either entirely unknown or was carried out in a few hospitals only, and even then haltingly and incompletely. Actually, the victory could not be achieved at one blow, but the terrain had to be conquered step by step. This was all the more so because LISTER made the public acquainted with his method as early as 1867 (*On the Use of Carbolic Acid* (*Lancet*, 1867), *On a New Method of Treating Compound Fractures* (*Lancet*, 1867)). But it was only in 1870, when he had perfected his method by many modifications, that it could rightly be called antiseptic. Consequently, especially in the earlier phases of its development, his new method met with opposition, and from SIMPSON in particular.

In his criticisms (*Carbolic Acid and its Compounds in Surgery* (*Lancet*, 1867)) SIMPSON referred to the history of disinfection methods. In his discussion of carbolic acid he points out that since the use of acupuncture, which he himself had introduced, it was often possible to hinder suppuration, so that the employment of carbolic acid or other disinfectants would be unnecessary. On the other hand, SYMES, HOLMES, HOLDERNESS, MACORMAC and T. BELL accepted the LISTER method of bandaging in the early years of its introduction (1867-69). LISTER, by the continual perfecting of his bandages, extended his methods to an ever-widening field of wounds and operations, and he achieved such success that other surgeons were forced to imitate his methods. After 1875 his improved methods had the greatest support and circulation in Germany, THIERSCH, NUSSBAUM, and above all VOLKMANN had fought for their adoption both by word and example.

In Vienna Professor DUMREICHER, at that time director of the first surgical clinic, was an unrelenting opponent

Disparaging statements on LISTER'S wound treatment—based on the unsuccessful trials of the military surgeon NEUDORFER in 1868 and of STEINER in 1872—also appeared in the *Wiener Medicinische Wochenschrift*. On the other hand DITTEL, the distinguished senior surgeon of the "Allgemeine Krankenhaus," spoke favourably of LISTER'S method for the healing of septic wounds (*Allg Wien med Zeitung*, 1869).

But the general attitude of the Vienna school towards LISTER'S innovations was for long dictated by the opinion of the great master of surgery, BILLROTH, for he was looked upon as an opponent of antiseptic methods, and particularly, on theoretical grounds, to LISTER'S germ theory. In 1874 he published his *Untersuchungen über die Vegetationsformen der Coccobacteria septica und der Anteil, welchen sie an der Entstehung und Vererbung der accidentellen Wundkrankheiten haben, und Versuch einer wissenschaftlichen Kritik der verschiedenen Methoden der antiseptischen Wundbehandlung*.

In this work BILLROTH reduces all the various forms of micro-organisms which are found in wounds to a single kind, namely the "coccobacteria septica." The cocci were held to represent the early stages of growth. In later stages they evolved into bacteria, which again formed cocci by sporulation. From this BILLROTH came to the conclusion that micro-organisms had no direct and important effect on diseases due to infected wounds. According to his theory, the first event was the inflammation of the connective tissue. In this phase arose a phlogistic and septic "zymoid" which rendered the tissue susceptible to the invasion of coccobacteria. The bacteria were only carriers or multipliers of the "zymoids," the quantitative variations of which explain the different courses which the disease may take.

BILLROTH did not admit that micro-organisms cause decomposition, and therefore he did not believe that the antiseptic system stood upon a solid foundation, as is

shown by the following words "That which of late years is often lovingly called the antiseptic treatment is in my opinion only a potential (potenzirte) 'antiphlegmonous,' or, as it used commonly to be called 'antiphlogistic' treatment of wounds—which antiquated term included treatment by bleeding, low diet, purging, and all the thousand and one rational and irrational methods of combating inflammation "

When, in 1875, LISTER undertook a continental journey, partly with a view to investigating the mode in which the antiseptic treatment was being carried out, he not only came into personal contact with the leading German surgeons of the day, but experienced a great personal triumph in the enthusiastic reception prepared for him by NUSSBAUM (Munich), THIERSCH (Leipzig), VOLKMANN (Halle), BARDELEBEN (Berlin), BUSCH (Bonn), and CZERNY (Heidelberg)

LISTER also spent three days in Vienna, "but it is surprising," writes Sir Rickman GODLEE, in his remarkable biography of LISTER, "that we have no record or diary of those few days in Vienna, and do not know whether he saw Billroth on this occasion. There is no mention of such a meeting in Billroth's published letters "

BILLROTH writes in a letter to VOLKMANN, October 27, 1875 "If you were not so energetic a supporter of this method I should say the whole thing were a swindle, but still Lister's personality charms me "

He also writes to VOLKMANN "I find the failures in Lister's treatment very instructive. I would on no account miss them. Absolute perfection has no interest for me. I am curious as to what will come after Lister, as a rule such things do not last more than five years." In a letter to NEUDORFER in November 1876 he says "I share your opinion that Lister's theory still has a hole somewhere, most investigators probably hold this opinion." A friendlier attitude is found in a letter which BILLROTH wrote in 1879 to his assistant MICKULICZ in

London "Best thanks for your letter from London I am glad you like British' surgery and 'British surgeons Lister's personality is exceedingly sympathetic I had already been afraid he was angry with me, because I had not entered immediately and unconditionally upon his ideas and upon his methods, he shows himself a great man also in this, that he is so much master of his creed that he can afford quietly to wait for the judgment of others" Indeed, in a letter to HIS, written in August 1879, he writes "It is nonsense, if I am reported to be an enemy of Listerism (I am in most friendly correspondence with Lister), but I become more and more an enemy of exaggeration I do not underrate the enormous practical progress, but when I survey the whole great field of surgery, its operative part hardly takes a third, and moreover, to a considerable portion of this antiseptics are inapplicable (all operations of the mouth, rectum, bladder, etc) I therefore can only consider it as terrible onesidedness to identify antiseptics with surgery" None of BILLROTH's letters to LISTER himself have been preserved

However, in spite of BILLROTH's attitude, the younger generation of surgeons threw itself with great enthusiasm into the propagation of the new doctrine, and outstanding among these was BILLROTH's colleague Eduard ALBERT, DUMREICHER's successor as director of the first surgical clinic in Vienna Already in 1876 he had published in the *Wiener Medizinische Presse* his *Bemerkungen über den Lister'schen Verband* and his distinguished *Lehrbuch der Chirurgie und Operationslehre* (2nd ed., Vienna 1881-83) takes the antiseptic-treatment of wounds for granted in all its chapters It is explained in the historical introduction that LISTER's method was the greatest and most important advance in the development of surgery The achievements of British surgery up to FERGUSON and Spencer WELLS are reviewed in particular detail in the four volumes of this work, which is based on an unusual knowledge of the literature

In the abundant literature on modifications of the antiseptic method which was published in the succeeding years, we find articles by BILLROTH'S former assistants CZERNY, MICKULICZ, WOLFLER, as well as by GERSUNY and CHROBAK and by ALBERT'S assistant MAYDL, and others

We must also mention that in the Vienna "Allgemeine Krankenhaus" the senior surgeon MOSETIG von Moorhof recommended in 1880 iodoform as a substitute for carbolic acid—an antiseptic which remained in use in wound treatment for a longer time than the other

Urology and orthopaedics were special branches of surgery which had distinguished exponents very early in the Vienna school

In England Henry THOMPSON won very great fame as a urologist. Very early in his career he showed his predilection for the surgery of the urinary organs and gained the Jacksonian Prize in 1852 for his dissertation "*On the Pathology and Treatment of Stricture of the Urethra*, and obtained the prize a second time in 1860 with his essay *On the Healthy and Morbid Conditions of the Prostate Gland*. In 1858 he visited Paris to study the surgery of the urinary organs under CIVIALE. THOMPSON at first crushed stones in the bladder at repeated intervals. When BIGELOW recommended crushing at a single sitting and removal of the fragments by operative measures, he improved the technique of the operation. Later, about 1886, when the discredited operation of suprapubic cystotomy was revived, THOMPSON became its advocate (*On the Suprapubic Operation of Opening the Bladder for the Stone and for Tumours*). Of his chief works, which appeared in many editions, the following were translated into German: *The Enlarged Prostate, its Pathology and Treatment* (Erlangen, 1867), *Practical Lithotomy and Lithotrity* (Berlin, 1882), *Clinical Lectures on Diseases of the Urinary Organs* (Berlin, 1877). His work, *On Tumours of the Bladder, their Nature, Symptoms and Surgical Treat-*

ment Preceded by a consideration of the best methods of diagnosing all forms of vesical diseases including digital exploration and its results (London, 1884) was published in Vienna in 1888 in a German translation by WITTEL-SHOFFER

Victor VON IVANCHICH, a pupil of CIVIALE'S, worked in Vienna from 1838 for four decades, and practised lithotrity with great success. But it was chiefly Leopold VON DITTEL, chief physician of the "Allgemeine Krankenhaus" and distinguished in many aspects of surgery, who played the chief part in laying the foundations of the Vienna school of urology. The clinical, diagnostic and operative technique of urology is dealt with in DITTEL'S numerous publications. His achievements in connection with the surgical treatment of stricture of the urethra, lithotrity, etc., were generally recognized. It is noteworthy that he played an important part in the introduction of suprapubic lithotomy and suprapubic prostatectomy.

An English surgeon, F. Swinford EDWARDS, reports on this as follows: "The suprapubic lithotomy had fallen into disrepute owing to the fatal results with which it was attended. But thanks chiefly to the researches of Dr. GARSON, late assistant-curator of the Museum of the Royal College of Surgeons, conducted at Vienna in 1887, and taken up not long after by Henry THOMPSON, suprapubic cystotomy has become a well-recognized and established operation, not only for the removal of large stones—encysted stones, small and large, and other foreign bodies—but also for the removal of growths whether of the bladder or prostate.

Suprapubic prostatectomy was first performed by DITTEL in 1885. In England MCGILL took it up, and became its warm advocate, in fact, it is pretty generally known as his operation."

Since the beginning of the nineteenth century attempts have been made to render the urethra, and later on the

interior of the bladder, accessible to the eye. Such efforts at endoscopy and cystoscopy were to a considerable extent initiated and successfully developed in Vienna. From 1872 Josef GRUNFELD made use of a simplified endoscopic examination of the urethra and bladder. His lighting apparatus consisted of the simple reflector used in laryngoscopy. He also improved endoscopic sounds. His simple method soon found a large body of followers. Whilst FENWICK had worked hard at this subject in England, the German physician Max NITZE and the Viennese instrument manufacturer, LEITER, divide the honours between them for inventing our modern cystoscope. This great advance was based on the direct illumination of the bladder by electric light, while the light source was placed in the instrument itself. The cystoscope was demonstrated by NITZE and LEITER at a meeting of the Gesellschaft der Ärzte in Vienna under the presidency of von DITTEL on May 9, 1879. As a result of cystoscopy the catheterization of the ureters became a useful clinical method, which was first practised by PAWLIK in Vienna without previous operation.

Robert ULTMANN, the distinguished specialist in the department of urology, is also to be numbered among the co-founders and many of his numerous publications appeared in English translation, such as *The Neuroses of the Genito-urinary System in the Male, with Sterility and Impotence* (Philadelphia and London, 1889, 1890), *Pyuria, or Pus in the Urine, and its Treatment, etc* (1884), *On Sterility and Impotence in Man* (London, 1887). His *Anleitung zur Untersuchung des Harnes* (2nd ed. Vienna, 1878) with his *Atlas der physiologischen und pathologischen Harnsedimente und die Harnconcretionen des Menschen* (Vienna, 1882) were translated into many languages. In later years Anton VON FRISCH and Otto ZUCKERKANDL were the chief representatives of urology in Vienna. The *Handbuch der Urologie* (Vienna, 1903-1905) was the fruit of their co-operation.

The Viennese surgeons DUMREICHER, BILLROTH, and particularly ALBERT worked at orthopaedic problems and methods, but Adolf LORENZ was the first to devote himself entirely to this field, and he became chief of the Vienna University clinic for Orthopaedics in 1889. His name is closely connected with the treatment of congenital luxation of the hip-joint (bloodless reduction). He published many works, the best known of which appeared in English translation as *Orthopaedics in Medical Practice*, translated by S C P Ritchie (London, 1913). The pioneers of orthopaedic surgery in Britain were Hugh Owen THOMAS and Robert JONES.

CHAPTER XIII

BLOOD PRESSURE, NEUROLOGY AND PSYCHIATRY

THE history of *blood pressure* begins with Stephen HALES, who before 1723 tied tubes into the arteries and veins of animals and estimated the pressure in the capillaries. Nearly a century passed before the subject was further investigated, experimental methods of estimating the arterial blood pressure were then pursued by a number of observers, such as POISEUILLE, Carl LUDWIG, MAREY. In 1836 BRIGHT had noticed the hard pulse in renal disease as judged by the finger, and he has been called "the first student of the hypertensive problem" (Janeway). The clinical estimation of blood pressure by instrumental means was first attempted by Vierordt in 1855 by measuring the weight necessary to stop the arterial pulsation.

The extraordinary Professor of experimental pathology in Vienna, Samuel VON BASCH in 1880, invented a *sphygmomanometer* which was applied locally over an artery and was widely used. This underwent modifications by Potain, Marrey, Mosso, Hurthle, etc. The present sphygmomanometric methods became generally available as a result of RIVA-ROCCI's modification of VON BASCH's instrument. Gustav GAERTNER's *tonometer* took the pressure by means of an elastic bag enclosing the finger (1889).

In London, F. A. MAHOMED's laborious observations on blood pressure made between 1874 and 1881 with his own form of Marey's sphygmograph, led him to anticipate much that is now known and far more easily verified. For example, he described a pre-albuminuric rise of blood pressure in Bright's disease, which with VON BASCH's conception of "latent arteriosclerosis" and Huchard's

presclerosis led up to the recognition of primary or essential high blood pressure, or hyperpiesia

The general use of the sphygmomanometer in Britain was largely due to Clifford ALLBUTT, BRUNTON, and G OLIVER Clifford ALLBUTT described the occurrence of high blood pressure without renal disease and introduced for this the word *hyperpiesia* (1895) He also insisted that long-continued high blood pressure may cause, but is not due to, arteriosclerosis

Neurology and neuropathology was a field of medicine which was cultivated enthusiastically in Vienna in the second half of the nineteenth century Considerable advances had been made in this subject in England since the beginning of the century The discoveries of Sir Charles BELL and Marshall HALL powerfully stimulated the study of the physiology and pathology of the nervous system, so that even the surgeons Alexander SHAW, Joseph SWAN, Herbert MAYO, Henry EARLE, Benjamin TRAVERS, etc , devoted attention to this subject

The pathology of the nervous system was studied in the first half of the nineteenth century by Samuel FOTHERGILL, John ABERCROMBIE, John CHEYNE, James PARKINSON, Herbert MAYO, David URWINS, William and Daniel GRIFFIN, etc , and in the latter half of the century by Thomas BUZZARD, J Spence RAMSKILL, Charles Bland RADCLIFFE, J Hughlings JACKSON, H Charlton BASTIAN, William Henry BROADBENT, Will Rich GOWERS, Francis Edmund ANSTIE, James Warburton BEGBIE, J Russel REYNOLDS, Henry HEAD

Concerning the studies made on the cerebral cortex, it must be mentioned that our knowledge of localization was amplified and refined particularly by the British investigators David FERRIER, SHARPEY-SCHAFER, F W MOTT, C E BLEVOR, Victor HORSLEY and others These advances led to the practical application of the new knowledge in the surgery of the brain

As early as 1865 Theodor MEYNER, the brain-ana-

tomist and psychiatrist in Vienna, had made a separation of the tracts of the brain into projection and association bundles, which seems to be in harmony with the theory of psycho-motor and psycho-sensory centres. The Viennese physiologist Sigmund EXNER produced a work in 1881 on *Die Lokalisation der Funktionen in der Grosshirnrinde*.

The neurologist Moriz BENEDIKT, among others, deprecated the tendency to exaggeration with regard to localization. As we have already mentioned, BENEDIKT gained a reputation in electrotherapy, and later published a great number of special works on neuropathology. His name is associated with the *Benedikt syndrome*, a name first used by CHARCOT. In his work *Nervenpathologie und Elektrotherapie* (Vienna, 1874-76) he refers to the histological works of Lockhart CLARK, and to Francis Edmund ANSTIE's book *Neuralgia and the Diseases which Resemble It* (London, 1871). BENEDIKT also published psychophysiological studies, and anthropological works dealing with craniometry and cranioscopy. He frequently dealt with the theme of the "criminal brain," as in his *Anatomische Studien an Verbrecher-Gehirnen* (Vienna, 1879) and *Kranimetrie und Kephalometrie* (Vienna, 1888). The former work appeared in English under the title of *Anatomical Studies upon Brains of Criminals. A contribution to anthropology, medicine, jurisprudence and psychology* (1881). In 1882 OSLER was aroused by the paper of BENEDIKT, who stated that the brains of criminals exhibit a deviation from the normal type, and criminals are to be viewed as an anthropological variety of their species, at least among the cultural races. This finding OSLER not only failed to support but pointed out that the supposed anomalies in question were frequent in the general run of human brains. The article represented a careful topographical study of the brains of two homicides, but it otherwise is somewhat sarcastic ("On the Brains of Criminals," *Canadian Medical and Surgical Journal*, 1882).

Subsequently an editorial appeared in the London *Lancet* taking OSLER to task for being too severe with Professor BENEDIKT, and to this OSLER replied, clearly setting forth the reasons on which he had based his own conclusions

BENEDIKT'S many-sided achievements won him recognition and honours in Italy, France, and Britain. He was an honorary member of the British Medico-Psychological Association and in 1888 he received the honorary Doctorate of Law in Glasgow. In his memoirs, *Aus meinem Leben. Erinnerungen und Erörterungen* (Vienna, 1906) he writes at length of his repeated journeys to Great Britain during the previous thirty years. He came into intimate contact with British specialists through invitations to scientific gatherings. He gave lectures as an authority on psychiatric and criminal anthropological questions in Bournemouth, Edinburgh, Glasgow and Dublin, and he published essays in English scientific journals. In his autobiography, among the British physicians whom he mentions with respect are Sir William TURNER, CLOUSTON, MACALISTER, MERCIER, BEADLES, and YELLOWLEES. In the official toast which he gave at the final banquet at the Bournemouth conference, he said "At the English meetings I found myself in full agreement with my English colleagues on all ethical questions, on all scientific questions which concern the common welfare, and particularly forensic medicine, and on all questions which common sense had to support against conventions and contemporary dogmatism." In his lectures and writings he often gave enthusiastic expression to his particularly high valuation of British medicine and the British medical profession.

Heinrich OBERSTEINER founded a neurological institute which attracted students from all countries, and from which issued a great number of works. His scientific achievements were unusually comprehensive and included the anatomy of the brain, the pathology of paralysis, epilepsy, concussion of the spinal cord, morphinism,

and hypnotism We may mention the following of his publications *Der Hypnotismus* (1887), *Die Lehre von Hypnotismus* (1893), *Funktionelle und organische Nervenkrankheiten* (1900), *Die Krankheiten des Rückenmarks* (1906) His work, *Anleitung beim Studium des Baues der nervösen Central-Organen*, which was widely used and appeared in five editions, was translated into English, French, Italian, and Russian A review of this work in *Brain* (1888), says "We have great pleasure in bringing this work before the readers of *Brain*, so we are confident that it will supply a want which is much felt, and it will not require any advocacy on our part to recommend it . The book is of especial value, as it brings into juxtaposition the normal and pathological appearances of the minute structure of the nervous system, whereby the recognition of minute departures from health is much facilitated It will be seen that this work is a most valuable contribution to the study of the anatomy and pathology of the nervous system, and we cannot speak too highly of the ability and skill which Professor Obersteiner has brought to bear on this most difficult subject We can confidently assert that it will be an invaluable aid to all who are working at the pathology and anatomy of the nervous system, and we can only hope that its usefulness in this country will be further enhanced by its translation into English " An English translation was published in London in 1890, with the title, *The Anatomy of the Central Nervous Organs in Health and in Disease*, by Dr Heinrich Obersteiner, translated with annotations and additions by Alex Hill The preface begins with the sentence "No apology is necessary for placing before the English student of neurology Professor Obersteiner's exact and impartial account of the anatomy of the central nervous system " OBSERSTEINER made a German translation of David FERRIER's work, *The Function of the Brain*, with the title *Die Functionen des Gehirns* (1879) FERRIER's *Croonian Lectures on Cerebral Localization*, delivered before the Royal

College of Physicians, June 1890, also appeared in a German translation in Vienna by Max WEISS (1892)

The eminent Viennese neurologists REDLICH, Hermann SCHLESINGER, and MARBURG all came from OBERSTEINER'S institute

Viennese neurologists were not concerned with the scientific study of hypnotic phenomena before the eighties, when their interest was aroused by the appearances in public exhibition of the professional "Danish magnétiseur" HANSEN The explanations of mysterious phenomena which were put forward by James BRAID as early as 1843 in place of the "animal-magnetism" theory, were already recognized as an important advance by BROCA and AZAM in 1860, and were confirmed by Charles RICHET in Paris in 1875 The physiologist PREYER in Jena translated BRAID'S *Neurypnology* into German in 1881 In England, Daniel Hack TUKE made important contributions to the doctrine of hypnotism by his works, *Mental Condition in Hypnotism* (1883) and *Sleep Walking and Hypnotism* (1884) The relevant literature shows that in Vienna BENEDIKT, OBERSTEINER, VON KRAFFT-EBING, and Sigmund FREUD studied hypnotism intensively They were in part followers of the school of Salpêtrière (CHARCOT etc) and partly influenced by the school of Nancy (application of suggestion to therapeutics)

The following authors, among others, were representative of psychiatry in England in the second half of the nineteenth century Forbes WINSLOW, John Charles BUCKNILL, D Hack TUKE, David SKAE, W L LINDSAY, J Fielding BLANDFORD, Thomas T CLOUSTON, and Henry, MAUDSLEY The last named contributed to the progress of psychiatry chiefly by his works, *The Physiology and Pathology of Mind* (London, 1867), *The Physiology of Mind* (London, 1876), and *The Pathology of Mind* (London, 1879)

In Vienna psychiatry was represented mainly by Theodor MEYNERT and Richard VON KRAFFT-EBING

sign into prominence Tetany after Thyroidectomy was reported from BILLROTH's clinic in Vienna in 1880 and 1882 by WEISS and by WOELFLER, and by VON EISELSBERG in 1890 Experimental thyroidectomy produced it (Horsely, 1885) In 1892 Eiselsberg produced tetany experimentally by excising a cat's thyroid which he had successfully transplanted into the abdominal parietes

At the end of the nineteenth century the Viennese pathologist Anton WEICHSELBAUM made a special study of pathological histology and bacteriology His works refer to the etiology of various infectious diseases, and particularly to tuberculosis He contributed to the extension of the study of tumours, of the pathology of joints and cartilage, and to the investigation of diabetes mellitus He deserves great credit for his untiring efforts against tuberculosis and alcoholism The diplococcus pneumoniae and the meningococcus bear his name, and he was the first to recognize tubercle bacilli in the blood from patients who had died of acute general miliary tuberculosis His *Grundriss der pathologischen Histologie* (1891) appeared in English with the title, *The Elements of Pathological Histology, with special reference to practical methods* Translated by W R Dawson (London, 1895)

Beside Weichselbaum, the eminent Viennese pathologist, Richard PALTAUF, took up bacteriology and founded a large institute for the study of immunity and production of *therapeutic sera* A man of encyclopedic learning, Paltauf wrote extensively and critically on agglutination and other subjects One of his assistants, Rudolf KRAUS, discovered in 1897 bacterial *precipitins* A pioneer in serodiagnosis, by means of agglutinating reaction, was the Viennese professor of Hygiene, Max GRUBER With him worked the English bacteriologist and pioneer on immune serum reactions, H Eds DURHAM, who conjointly with his teacher discovered bacterial *agglutination* (1896), and its significance in bacterial diagnosis LEYTON (formerly Grunbaum), English bacteriologist, worked

also with Gruber in Vienna and was the first to study the *agglutinating reaction of serum in enteric fever*, but was anticipated in publication by WIDAL. One of S. Stricker's assistants, Emanuel KLEIN, left Vienna, went to England as a histologist and took up bacteriology soon after his arrival. William BULLOCH, a bacteriologist of world repute and historian of bacteriology, Alex. OGSTON, I. W. WASHBOURN, Edm. Jos. WENEY visited several centres of learning on the continent and came into contact with Continental scientists, particularly those in Vienna. Ernst WERTHEIM, the great Viennese gynaecologist, famous for his operations for uterine cancer, carried out exact researches on *gonococcus* (1892) and was the first to show the importance of this microbe as a cause of diseases in women.

At about this time the New Sydenham Society published English translations of the following works of Viennese medical authors: F. A. SALZER *On the Healing of Foreign Bodies* (London, 1894), J. NEUMANN, *Pemphigus Vegetans trans by F. H. Barendt* (London, 1897), M. STERNBERG, *Acromegaly trans by F. R. B. Atkinson* (London, 1899), R. R. VON LIMBECK, *The Clinical Pathology of the Blood trans from the second German edition by A. Latham and J. Nachbar* (London, 1901).

The work of Theodor PUSCHMANN, the Viennese historian of medicine, on the history of medical teaching, was also translated into English with the title, *A History of Medical Education Translated by Evan H. Hare* (London, 1891).

It was not until 1908 that Osler revisited Vienna, with the purpose of attending the annual "German Kongress fuer Innere Medizin."

In a long letter concerning this Vienna visit which he subsequently wrote for publication—"Vienna After Thirty-four Years" (*Journal of the American Medical Association*, May 9, 1908)—he mentions the session of the congress, the social functions, the old hospital which he revisited

"On entering the time-worn wards, at that time constituting VON NEUSSER's clinic, he exclaimed 'Shades of Hippocrates! The same old place Even the nurses haven't changed' " Nevertheless, there were plenty of contrasts to former days He had what he calls a "Queen-of-Sheba sensation" on visiting the first group of the new buildings of the Allgemeines Krankenhäus, "erected at Government expense, the most perfect of their kind in the world, well worthy of the founder of the Vienna school—buildings to make one despair of private institutions" The letter makes clear that Osler chiefly foregathered with the younger men

" Austria may well be proud of what Vienna's school has done for the world, and she still maintains a great reputation, though it cannot be denied, I think, that the Aesculapian centre has moved from the Danube to the Spree But this it is what has happened in all ages Minerva Medica has never had her chief temples in any one country for more than a generation or two " Indeed, the age of a universal medical centre, in the sense in which Vienna was formerly a centre, is past and gone for ever Methods of medicine have become uniform everywhere and new achievements are rapidly made known throughout the world In the first thirty years of the twentieth century, however, Vienna not only upheld its fame in all clinical and in some of the theoretical branches, but contributed by important investigations to the advance of medical science, particularly in the realms of haematology and endocrinology, of cardiology and neurology, while also the study of the constitutional factors of disease and of the disorders of metabolism was intensely developed The most influential conception of *Allergy* originated in Vienna, and on its soil started the Roentgenotherapy of cutaneous diseases as well as methods of dosimetry for X-rays Not less than three Viennese medical investigators have been awarded the Nobel prize, BARÁNY, who interpreted "vestibular nys-

tagmus" and introduced the nystagmus test, LANDSTEINER, who discovered blood-grouping by haemagglutination and revolutionized the whole subject of transfusion, and WAGNER-JAUREGG, who postulated the general theory of the influence of febrile diseases upon psychoses and started the malarial treatment for general paralysis. Also during this period the connection between the Vienna school and British Medicine was an active one. We shall confine ourselves to naming a few of the chief representatives who were in the closest association with Great Britain.

Hans Horst MEYER, who promoted scientific pharmacology by bringing it into a close relation with general biology, pathology and clinical medicine, was known in England and America by his numerous visits. His chief work appeared in English translation *Pharmacology, Clinical and Experimental, a Groundwork of Medical Treatment*.

Ant VON EISELSBERG, a bold and skilful operator, the leader in neurosurgery in Austria, a prominent worker in pituitary surgery, was awarded the Lister Medal for distinguished contributions to surgical science in 1927.

K F WENCKEBACH was notable for his work on cardiac disorders, particularly the arrhythmias. In conjunction with James MACKENZIE he applied Gaskell's work on the heart with great effect. He advocated division of the depressor nerve in the special lecture he gave in the Library of the Royal College of Physicians of London in 1924.

M HAJEK, whose large publications on diseases of the larynx have been translated into English, visited London, 1928, when he delivered the Semon Lecture.

Clemens v PIRQUET, an original investigator who greatly extended ideas on infectious diseases, discovered the *cutaneous tuberculin reaction* known by his name, and introduced the conception of *Allergy*. Also he invented a new system of alimentation (*Pelidisi-Tafel* (English edi-

tion in 1921)) Pirquet's collaborator, Edmund NOBEL, published *Grundrüge des Pirquet'schen Ernährungs systems* (translated into English)

Pirquet was largely responsible for the development of the magnificent children's hospital attached to the University of Vienna and it was he who collaborated with the British and American relief work in averting the worst horrors of starvation in the youthful population of Vienna after the last war. He repeatedly gave lectures in England. Pirquet's posthumous work, *Allergie des Lebensalters*, edited in 1930, is based on British medical statistics

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